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What is the Purpose of Government?

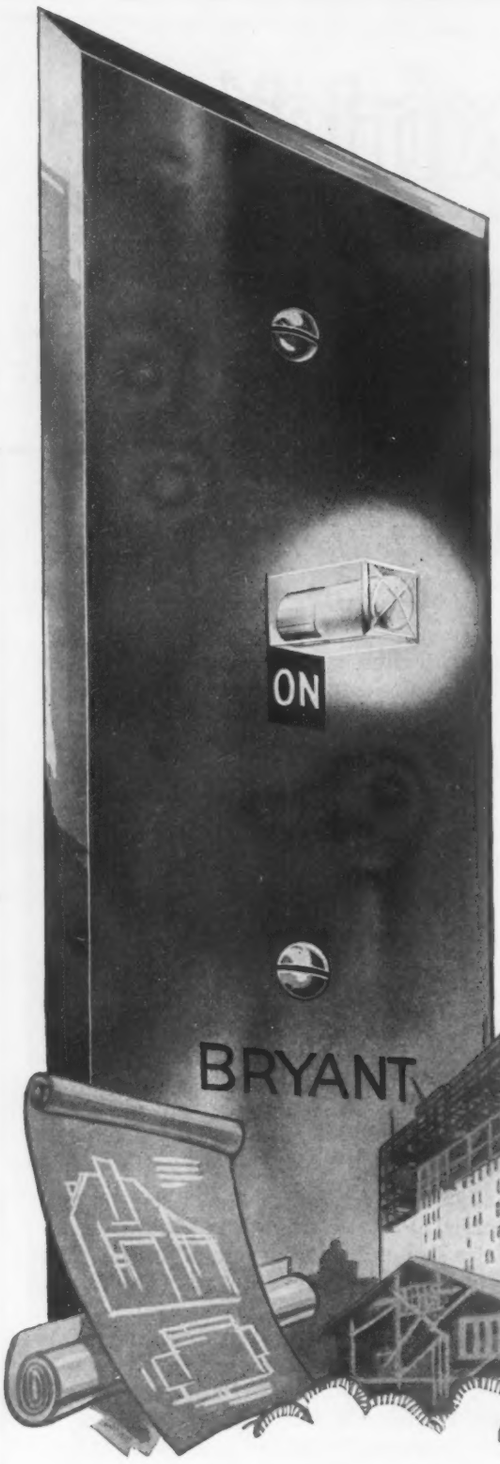
AN after-dinner story making the rounds at the present time will bear repeating to our readers. It relates that two travelers were standing on the brink of the Colorado River canyon viewing that stupendous spectacle for the first time. Said the first traveler:

"What an awe-inspiring sight! Do you know it took thousands of years to dig that hole?"

"Then," replied the second traveler, "it must have been a government job."

You smile because you know that in a few words this story exemplifies one of the greatest single failings of government. Yet in California and Washington certain elements are proposing that the government take over the light and power industry.

In the September first issue of the Journal of Electricity an attempt will be made to show the failure of government ownership and operation of an industry as specialized and as complicated as the generation and distribution of electricity. We feel that the purpose of government is to govern, to regulate, to administer rather than to compete with the business enterprises of its citizens. We have gathered together a mass of information and data to prove this contention. We are offering it to our readers with the hope that it will furnish them with the basis for arguments which will controvert the propaganda now being spread in behalf of the measures which would take the light and power business in California and Washington out of the hands of those who developed and administered it so wisely and throw this important industry into politics.



You Couldn't Wish for a Bigger Market

Some of us old timers can remember when electric flatirons were given away to get them off the shelves. There was a big market but no demand. And now look at the sales!

With this in mind, pause—and consider the Bryant Tumbler Switch with Bakelite Luminous Handle. It can be seen in the dark from any angle.

Here's a new device that fills a definite and long overdue need. The market for it is everywhere, but the demand is just beginning to grow. In a short time there will be just as big a demand for self-locating switches in comparison with the ordinary kind as there is for electric irons in comparison with the cast iron variety.

Just consider these advantages of the Bryant Tumbler Switch with Bakelite Luminous Handle:

1. *It completes the practical convenience of electric lighting.*
2. *Its first cost is its last cost.*
3. *It brings an added profit.*
4. *It can be sold for any job:*
   a] *When the specifications are being written;*
   b] *When the job is being wired;*
   c] *To replace other switches on old work.*

The most astute and successful architects and contractors in all parts of the country are enthusiastic about it and are using it on good jobs. They are making business out of it. Are you?

"Notice the Lighting Equipment"

BRYANT
SUPERIOR WIRING DEVICES

"A Superior Wiring Device for every Electrical Need"

THE BRYANT ELECTRIC COMPANY

BRIDGEPORT, CONNECTICUT

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California and Quebec Vie for First Honors

COMMENTING upon an address before the Canadian Electrical Association by P. T. Davies in which the statement was made that the annual per capita consumption of electrical energy in the Province of Quebec was 820 kw-hr., one of our contemporaries, in a recent issue, says, "This is probably the highest in the world and certainly is the highest thus far established in the two Americas." Certainly Quebec has established an enviable record but it falls short by almost 100 kw-hr. of approaching that set up by California, where in 1923 the average per capita consumption reached a total of 903 kw-hr.

California has been one of the leaders in electrical development and has been pointed to as a place where "world records" in generation, transmission, and other phases of development are constantly being set up and just as constantly being broken. Moreover California's privately owned and publicly regulated utilities have reason to be proud of their many achievements, not the least of which is the development of energy consumption to a point exceeding that in any other similar political subdivision.

In 1923 the utilities of the state sold to their consumers 3,533,436,193 kw-hr. of energy. On the basis of the U. S. census estimate of the population of the state on Dec. 31, 1923, which is given as 3,913,236, the per capita consumption for that year was 903 kw-hr., exceeding the consumption in Quebec by slightly more than 10 per cent.

A further comparison of the electrical systems of the two may be obtained from the per capita generation. A report issued by the Canadian Dominion Bureau of Statistics entitled "Central Electric Stations in Canada" 1922, shows the total kilowatt-hours generated for the Province of Quebec as 2,539,874,000. Based upon a population in 1921 of 2,361,199, the latest available figure, the kilowatt-hours generated per capita is 1,070. Records compiled from the United States Geological Survey reports of the output of electrical energy in California for 1923 show that the per capita generation in that state for 1923 was 1,310 kw-hr. In the two instances the losses between generating station switchboard and consumer's meter are 31.5 per cent and 30.5 per cent for California and Quebec, respectively. Quebec has approximately 4,000 miles of transmission lines. One single California utility has almost as much. Thus it is seen that with a larger area, greater transmission distances and many times more miles of line, the California utilities are setting a performance record fully as good as that of Quebec.

The records of both California and Quebec are marks for other states in the United States and Canada to equal. Both are enviable and in both cases the electrical industry should feel proud of such achievements, especially since they were accomplished, despite handicaps, under private ownership.

Politics and Sound Regulation

WHAT an amazing spectacle is presented in Idaho where, as recounted in a news story on another page in this issue, the state regulatory body has issued an order indirectly attacking the electric rate schedule that the commission itself fixed after four years of tedious effort and investigation. Coincident to this "show cause" order, and of particular significance, was the dissenting opinion of one member of the commission vigorously condemning the action of his colleagues and voicing the conviction that, under the circumstances, the commission "has forfeited any right to be considered seriously, except as a necessary stopping place on the way to the courts." As a matter of fact this is actually what the Idaho Power Company has done, having filed within the past few days a bill of complaint naming the public service commissioners and the attorney-general of the state, which is equivalent to bringing suit against these parties.

Politics is said to be at the bottom of the movement which resulted in the issuance of the "show cause" order, which has disturbed both the public and the light and power industry of southern Idaho, and which threatens to reopen a valuation and rate case just settled after four years of work and much expense to the taxpayers. Furthermore, it is merely the latest of a series of orders which have tended to harass and hamper the Idaho utility to the extent that it has cut to a minimum its capital expenditures for this year, and has promised that, until a settlement of the unstable condition created by these orders is reached, such expenditures will be curtailed further. Surely this is an unhealthy situation for the State of Idaho, which, in common with all the other Western states, needs most of all new capital for legitimate growth and for the development of its agricultural and industrial resources.

The remedy for this and similar situations lies with the people. Regulatory bodies should be selected with the greatest possible care and the compensation of the commissioners, if not made equal to that of members of the supreme bench, should be such that it would attract men of the highest caliber and qualifications.

Experience has demonstrated in more than a score of cases that politics and sound regulation, like oil and water, will not mix.

The Salmon Industry and Power Development

CAN salmon be taken successfully over a dam exceeding 40 ft. in height? Conversely, can salmon fry be brought safely downstream over a similar artificial obstruction? Upon the answer to these two questions depends the future power development on the Columbia River and upon several of the major California streams—notably the Klamath River. That these two problems must be solved before the Federal Power Commission can issue permits for development of the Priest Rapids site on the Columbia is the attitude adopted by the Federal Bureau of Fisheries. Rather than wait for the answer to the questions and in the meantime witness the passing of one of the last spawning grounds of the salmon in California, the Fish and Game Commission of that state has sponsored an initiative measure which has already secured sufficient signatures to assure it a place on the November ballot, prohibiting the construction of dams of any character on the Klamath River. This action has been taken in view of the announced intention of the Electro Metals Corporation of San Francisco to construct two power dams at the confluence of the Klamath and Shasta Rivers, and the receipt by that company of a permit from the Federal Power Commission.

That the federal government must recognize the rights of fishing interests as prior to those of applicants for power sites is the attitude adopted by the Bureau of Fisheries and the salmon packing industry. From the standpoint of the importance of the fishing industry on the Pacific Coast, this attitude is perfectly justifiable. It is estimated that the annual salmon pack of the Columbia River region is valued at $10,000,000 and that that of Alaska greatly exceeds this sum.

A cursory study of the habits of the salmon reveals some interesting facts. The salmon is a migratory fish, spawned and hatched in fresh water and spending the greater portion of its life in the sea. The adult fish ascends a stream to spawn after four or five years spent in the ocean. This annual migration takes place in the fall, the month it starts depending upon the stream. The fish spawn and then die. The eggs hatch in the spring and the fry gradually work down stream toward the sea, reaching salt water six months to a year after hatching. The important fact is that each fish returns to the stream of its birth to spawn.

It is only recently that an intensive study has been made of the habits of the fish. When power developments were considered, it was customary to take into consideration the construction of a fishway wherever a dam was constructed on streams frequented by the salmon. But when it was determined that the fish would not cross dams exceeding 40 ft. in height and when active plans were made for the construction of dams higher than this on such streams, the fishing industry arose en masse to voice its objections.

The belief is that salmon can be mechanically carried over even the highest dams in elevators or by means of escalators. However this has not been proved. The fishwheels used on the Columbia River seem to indicate that this is possible. It has not been proved that the salmon fry can be carried over a dam to the stream below. If the flow of water is sufficient, they could pass over the spillway, but such is not always the case. A test made at the University of Washington with a small turbine operating under a comparatively low head showed that approximately 60 per cent of the fry could pass through the turbine runners without injury. It is believed that with larger turbines this percentage can be raised materially provided the fish can survive the pressure to which they would be subjected in the penstock and the turbine itself.

Already a committee composed of representatives of the fishing interests and the power companies of the Northwest is engaged in the study of this problem. An experimental elevator is to be constructed at the Long Lake plant of the Washington Water Power Company. Apparently in this district the power interests and the fishing industry are in complete harmony. Both desire a fair solution of the problem and both are aware of its importance.

In pushing an initiative measure to prevent power development on the Klamath, we feel that California is acting too hastily. Would it not be better to follow the example of the Northwest and definitely study the situation rather than rush blindly forward with a law which precludes development of the enormous power resources of the northwest portion of the state? Cheap hydroelectric power is such an important economic factor in the development of so rich a district as the Klamath River region that it seems foolish to take such action. Especially is this true when the opportunity exists for King Salmon and King Kilowatt to cooperate to mutual advantage.

The Passing of Benjamin G. Lamme

IN the passing of Benjamin G. Lamme on July 8 last, the electrical industry and the world in general has suffered a great loss. With Mr. Edison, and the late Dr. Steinmetz, Mr. Lamme was one of the "Big Three" in electrical engineering now reduced to one surviving member, Mr. Edison.

It is related of Mr. Lamme that, during his association with the Westinghouse company, no less than 150 inventions, many of them epoch-making in their character, have been credited to him. Every conceivable recognition has been awarded to him by his fellow engineers and scientists. Yet, outside of professional and industrial circles, Mr. Lamme was

comparatively unknown. He never became material for copy at the hands of the general magazine space writer. That sort of thing was utterly foreign to his nature.

Those who knew him best, his associates and especially the younger men in the Westinghouse company, speak with genuine affection of his modesty, his never-failing kindness and consideration for the runners-up in the electrical industry. Always approachable, always glad to lend the aid of his ripe experience and judgment toward the solution of the problems that were perplexing his juniors, he became more than a mere man; he became an institution whose passing will leave a void in the ranks of the profession that will indeed be difficult to fill.

A Practical Application of the Golden Rule

THE electrical industry has long been noted for its cooperative spirit and for its generous support of worthy causes. From the manufacturer to the contractor-dealer, it has always given freely of its aid and of its substance whenever called upon to do so. Recently there arose an instance of this spirit of generosity that transcends anything we have known of. Elsewhere in this issue is the story of the cooperative effort of the entire electrical industry of San Diego, Calif., in behalf of the children of tubercular parents in that city. This act of human kindness included the mayor of the city, a major-general of the Marine Corps, the members of the local union of the International Brotherhood of Electrical Workers, the jobbers, the manufacturers and the contractor-dealers. In less than one day, working as a unit and under the direction of competent executives, this united organization, using materials that had been donated and labor that was paid for only in the return that comes from a charitable deed, performed services to the Helping Hand Home that would have cost at a conservative market valuation in excess of $3,000. The work was done and the completed job turned over to the officials of the home with the compliments of the Electrical Exchange, a composite organization of the industry in San Diego. Who shall say that the milk of human kindness has soured within the breast of the electrical fraternity?

Closer Attention Should Be Paid to the Extension of Credit

THE proper ratio of electrical contractor-dealers to population seems not to be very clearly established. In some localities there are found more firms of this class per thousand inhabitants than are in other cities or towns of the same size and of similar general characteristics. No one has yet offered a ratio figure for the guidance of the industry. It is a fact, however, that in many cases the greater number of contractor-dealers per thousand people is occasioned by the liberality of jobbers' credit policies. It seems to be the case that in many instances jobbers are extending credit beyond an individual's or a firm's capacity. Such action cannot but react disadvantageously. It creates an unfair competition by attracting more men to this field of activity and this uneconomic competition is often demoralizing to the entire local branch of the electrical industry. Too liberal credit, or the extension of credit without due regard to all factors bearing on the financial and moral hazard, encourages inexperienced and often incompetent men to enter the business. The results of such occurrences are written boldly in red ink on the pages of electrical merchandising history. The practice of encouraging additional retail outlets in a locality already well served, merely for the purpose of meeting competition between jobbers, should not continue.

Is There a Summer Slump in the Electrical Business?

TRADITION, precedent and rumor are powerful factors in our business life. Take, for instance, the so-called "summer slump." It is traditional. So many business men expect it that it is bound to have a psychological effect upon trade. We are inclined to think the summer slump is somewhat of a myth. Figures recently compiled by the New York American seem to bear out that belief. A survey of business during July and August—the months when the slump is supposed to be at its height—showed that

Street car traffic is 99 per cent normal
Telephone calls are 87½ per cent normal
Factory employment is 98½ per cent normal
Factory payrolls are 98 per cent normal
Savings bank deposits are 100 per cent normal.
Wholesale drygoods are 97 per cent normal
Wholesale hardware is 95½ per cent normal
Building contracts are 99 per cent normal

We are ready to back up these facts against any "they say" statements regarding the summer business situation.

The above figures are general. However, let us get specific about the electrical industry. The jobber, in order to have his fall stock on hand after Labor Day, must order in June and July. The dealer, if he is to be prepared for the fall buying which starts in September, must do his ordering in July and August. In most districts, summer is the period of greatest building activity owing to its advantageous climatic conditions. Contractors, then, are at the height of their buying.

The statement that the public does not buy during the summer does not hold as far as the electrical industry is concerned. Summer is the time to sell electric fans. Vacationists are good prospects for radio sets. The demand for lamps is not affected. Hot weather is a good time to sell electric ranges. Toasters, grills, percolators and waffle irons—the entire lot of so-called table appliances—have a ready demand, for the housewife is looking for something which will make the work of preparing meals during hot weather less irksome.

We repeat that the summer slump is a myth. Business is there for manufacturer, jobber and retailer. Hot weather brings the desire for relaxation, which is another word for laziness. If business is properly cultivated during the summer, it can be had.

CURRENT COMMENT

California is faced with a water and power shortage—the worst in the history of the state. Every conceivable step is being taken to meet the emergency, both by the privately owned utilities and by their customers. Yet there are papers in the state which blame the power companies for an unforeseen act of Providence and which are using the fact that there is a power shortage as an argument in favor of the Water and Power Act. How absurd the arguments in the following editorial from the Oakland (Calif.) Post-Enquirer must seem to anyone with an average amount of intelligence:

The California Press and the Power Shortage

Housewives down in southern California are being told they must not use their electric irons, electric washing machines, electric vacuum cleaners.

In some places in the southern part of the state people are allowed to use telephones only during a short interval in the day.

The use of power in factories is being restricted. That means a serious, harmful condition of affairs, caused by a power shortage. The power shortage is caused by a water shortage.

But WHY should there be a shortage?

The answer is that the water and power business in California is controlled by a number of competing private companies more interested in making money than in conserving and co-ordinating intelligently the water and power resources of the state.

The proposed California Water and Power Act, designed to protect and further the public interest AT ALL TIMES, provides for such an emergency as one section of California faces now.

But Eustace Cullinan, administrator of the power company slush fund used to defeat the Water and Power Act in 1922, said in an article published Oct. 1, 1922:

"There is an abundance of electric power in California for all uses. . . . These established facts have rather flattened out the noble band that offered us the water and power act as a means of salvation from the 'cruel power barons' and promised to set every stream in California busy making power for a population already supplied with all it needs."

In 1922, A. B. West, president of the Pacific Coast Electrical Association, said that the power companies were willing to face the "public ownership threat" squarely on their record of achievements, particularly the achievement of providing adequately against all regional power shortages.

Unfortunately, something has happened to that record.

The late John A. Britton, on Jan. 25, 1922, in a published article, wrote:

"Let us stop talking about power shortage. . . . There is no power shortage today and with the program of power development marked out there will be no power shortage in the future."

The future he was talking about is here, and there is a power shortage. So much for that.

The moral is: Don't believe all the corporation gentlemen tell you and are anxious to have you believe.

They are especially anxious to have the public believe that it cannot manage its own affairs; that it should not own the necessary public resources and utilities; that through some inscrutable arrangement with ultimate wisdom, the snow which falls in the mountains and generates power as it melts and runs down to the sea does so for their own private benefit and remuneration; and that any effort on the part of the public to control in its own behalf this natural resource of water and power is ill-advised impertinence.

That's what they will tell you, just as they told you there couldn't possibly be any power shortage under their benevolent reign. But the people are becoming wise, slowly.

The effort of the power companies, trying to stop the orderly process of evolution toward the efficient public ownership of public utilities, is as futile and pathetic as the efforts of the old hand weavers of England in trying to stop the coming of the machine loom.

Contrast the above with the following saner view which is adopted by the Los Angeles Times, a paper which is more familiar with the shortage because it is the spokesman for the territory most affected:

The year 1919, according to the records, brought the lightest rainfall to California in a generation. Basing their provision against any probable emergency upon the low figures for that year, the light and power companies made what seemed to be ample safeguard against any shortage.

But the unexpected happened. No human wisdom could foresee that 1923-4 would hit a lower level. So it has come about that, despite vast increase in the capacities of the private companies and the growth of supply at the command of the city's Public Service Bureau, the amazing growth of southern California, taken together with the shrinkage of nature's supply of water, has outstripped all these and brought us to the urgent need of conservation now for the common welfare.

The present emergency is temporary but acute. Its kind has been the lot of many other American communities. Only in degree is it truer of California than of other states that water is its life fluid. It is a universal human need and an inscrutable Providence sometimes withholds it to the point of peril.

Perhaps it is to test our mettle. At any rate, such a test now confronts us. Pending the augmentation of the present supply, which is going on at the highest possible pressure, it devolves upon us, small and large consumer alike, to make sacrifice in such proportion as shall be fixed by the State Railroad Commission, the power companies and civic bodies with as much impartiality as they can.

If the present emergency is met in the right spirit it will soon pass with slight harm or discomfort to anyone. The autumn rains and the rapid construction of additional large supplies of power will bring relief and, it is assured, a wide margin of safety that will be ample for any possible future situation.

But, pending that time, the public must make the work of conservation easy for all by a pooling of their help and sacrifice, as the light and power companies are doing with their "juice." The alternative, let it be said frankly, will be a more serious situation in the late summer. We must be resigned for some weeks ahead to get along without familiar conveniences and even some of the things we have come to regard as necessities.

The burning of a few needless lights or the making of morning waffles in the electric device that is so handy may not seem important in any single home. But in the aggregate of thousands of homes it is a big factor in a highly important situation. The power so used is needed to give men employment in shops and stores.

Cut out the needless use of "juice" in every form. The large consumers are making heavier sacrifices under the direction of the State Railroad Commission which has taken charge of the situation as its paramount duty at this time.

The Farmer and the Bone Free Power Bill

The filing of the petitions for the Bone "Free" Power Bill with the secretary of state at Olympia, Wash., further emphasized the fact that only in Seattle and Tacoma is the feeling particularly strong for this measure. By far the greatest majority of signatures were from these two cities and in eastern Washington hardly more than a thousand or more people were sufficiently interested in the question to affix their names to the petitions. If the rural press of the state can be taken as a gage the measure will not receive many votes outside the two cities which are at the present launched upon municipal ownership campaigns which even now are partially regretted. For example, the following editorial from the Shelton (Wash.) Mason County Journal claims the farmer will have to pay the bills if the measure passes:

> The trend toward enlarged municipal ownership and civil service organizations in the cities directs attention to the fact that the public employees are fast reaching the point where they are in control of local elections and practically so as regards state affairs and candidates, and thus more or less of a menace to the taxpayers generally.
>
> The Journal does not recall an instance where any of the organizations have gone on record for lower salaries or reduced taxation, as affecting their own status, but the movement is ever toward increased demands in the matter of more wages or less hours of labor, either of which spells more taxes for the rest of the state.
>
> For this reason alone, if for no other, the voters of the state should be slow in adopting any more public ownership measures than now exist, or in building up a larger body of public employees to wield more political power, and by reason of their closer organization carry through projects in which their interest is largely selfish.
>
> When it is considered that rarely does more than fifty per cent of the qualified electorate take interest enough to vote, it can readily be seen that the organized public employees, although they may be a minority of the whole readily wield sufficient influence to carry through their demands and fatten up their jobs.
>
> The unanimity with which Seattle is supporting the Bone "free power" bill and the frantic appeals to get signatures in Seattle indicates the anxiety of this element to further expand the avenues for public employment, even to reaching outside for other resources to add to the opportunities for such expansion, and to extend the political power of the city over the state.
>
> That the farming and country dwellers should be gulled into handing over the only club they hold for protection into the hands of their city "friends" passes comprehension, and that any farm organization should offer encouragement savors of an unholy combination in which the farmer will as usual be the "goat."

The private interests are doing a good job of supplying the state with power in the opinion of the Tacoma (Wash.) News-Herald, which says:

> It would be a grave economic error to handicap future development of our power resources by independent interests, and this would most certainly be one of the results of a favorable vote on the Bone Bill. Encouragement should rather be given to the full employment of this magnificent resource, which is the basis of enlarged and economic industrial activities, of which we stand in immediate need. The State of Washington could commit no more serious error than to assume an attitude of hostility toward constructive enterprise by indulgence in this socialistic experiment.

The Colfax (Wash.) Gazette thinks it sees the joker in the Bone Bill in the following editorial:

> The attempt to put over an initiative measure for public ownership of city, county and state electric power plants has the above heading which is very misleading.
>
> The idea that a great superpower program is to supply electric current to the entire state without expense to the consumer, is very attractive. But can an intelligent man or woman believe such a statement?
>
> The big cities in the State of Washington are already bonded almost to the limit, and to build large hydroelectric plants and distributing systems will strain the credit of the entire state, and how can the taxpayer escape?
>
> To create the impression that when cities, counties, districts and the state are fully launched in the power business, that electric energy will be furnished free of cost to the consumer, is a tremendous fraud.
>
> The joker in the whole superpower program is revealed in the argument made that the big cities will have to have cheaper power than the country districts because they are already more heavily taxed. Anyone should see the joke.

Even in California the rural press is not fooled by the arguments of the proponents of either the Bone Bill or the California Water and Power Act. The San Leandro (Calif.) Reporter in a recent editorial takes the following stand:

> In several Western states—notably California and Washington—an effort is being made to put the state into the power business.
>
> The promoters of this form of state socialism promise cheap power, and some of their newspapers and public speakers call it "free power."
>
> There will be on the ballot in November in Washington, a bill referred by the legislature allowing city-owned hydroelectric plants to supply country districts.
>
> This bill would impose a 5 per cent gross earnings tax on the cities for all power sold as a source of state revenue.
>
> Another bill in Washington proposes to permit cities to sell electric power tax-free and these two measures conflict with each other.
>
> Generally speaking, initiative measures putting the state into business have not fared very well in the West. In Washington, out of 52 bills with the secretary of state since 1907, only 10 got enough signatures to get on the ballot and, of these, only 3 were enacted into law.
>
> The best advertisement for Washington and California is to vote down any kind of socialistic measure.

WHO LEFT THAT LIGHT ON IN THE BATHROOM?
IT'S A FINE OPENING FOR THE FAMILY CRAB!
WE CAN COUNT ON THE WHOLEHEARTED COOPERATION OF SISTER AND HER SHEIK!
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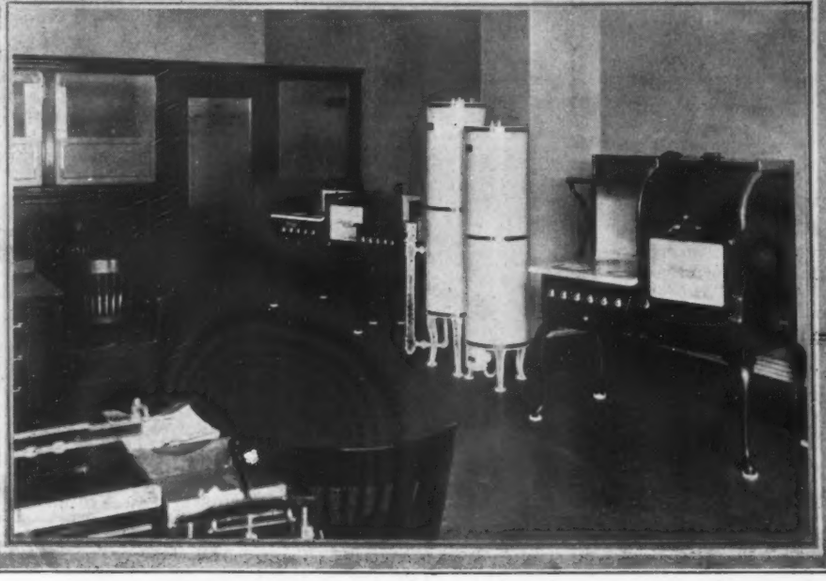
GALE

Gale in the L.A. Times

SPEAKING OF POWER CONSERVATION

FINDING that the growth of San Diego was putting a serious strain upon its office facilities, the San Diego Consolidated Gas & Electric Company in 1923 purchased the Timken Building, entirely remodeling the structure and moving in on June 16, 1924. The new quarters are in keeping with the desire of present day utilities to serve the public to the fullest possible extent. The commercial, collection, investigation and securities departments, shown in the accompanying views, have been placed on the main floor, for the greater convenience of consumers. At the top is one corner of the lobby, in the center is a general view of the offices and below the commercial department.



The Co-ordination of Irrigation and Hydroelectric Power

By Louis F. Leurey
Electrical Engineer, San Francisco, Calif.

IN a recent issue of the Journal of Electricity John D. Galloway contributed a very able article on "The Interdependence of Irrigation and Hydroelectric Power." His article sets up in a most explicit and logical manner the mutual interest that exists between the high-head high-level type of plant for electric power purposes only, and the low-head low-level type of plant for irrigation purposes primarily, with an electrical generating plant as a by-product. It will be the purpose of this article to suggest a machinery by which the admitted interdependence can be officially recognized and by which a co-ordinated function can be established between private and public interest without involving the financial participation or credit of the state.

In a paper prepared for the San Francisco Chapter, American Association of Engineers, and published in "Pacific Engineer," October, 1922, Edward E. Carpenter has developed the following tables showing the magnitude of possible electrical power byproduct for a number of definitely projected California developments. Mr. Carpenter states:

"The importance and magnitude of these possible blocks of byproduct power are, I believe, not generally realized. The following data regarding five of these typical installations, three of which have progressed to a point of assured consummation in the near future, are presented to assist in comprehending it:

Project	Height of Dam Effective Ft.	Storage Acre-feet	Irrigated area acres
Modesto-Turlock, Don Pedro, Tuolumne	270	280,000	250,000
Merced-Exchequer, Merced River	295	270,000	190,000
Madera, San Joaquin River	300	600,000	350,000
Pine Flat, Kings River	315	600,000	850,000
Iron Canyon, Sacramento River	145	961,000	225,000
Total		2,711,000	1,865,000

	Projected Annual Output Total Kw-hr.	Projected Annual Output Kw-hr. Per Acre
Modesto-Turlock	90,000,000	360
Merced	121,000,000	630
Madera	200,000,000	570
Pine Flat	440,000,000	520
Iron Canyon	320,000,000	1,540
Total	1,171,000,000	600

"The hydro output of the Pacific Gas and Electric Company for the year 1921 was 1,025,000,000 kw-hr., and the output for the whole State of California for the same period was 3,250,000,000 kw-hr. The above five projects, embracing in round figures 1,900,000 acres of the state's agricultural area, populated by communities rural in character and not conditioned to become large users of their power byproduct, are beyond question capable of producing as an incidental to their irrigation function a block of hydroelectric energy approximately equal in amount to the total present hydro output of the Pacific Gas and Electric Company and to one-third of the hydro used in the entire state."

It is quite apparent from the foregoing tables that the irrigation byproduct electric plants form potentially a very important factor in future electric power production and will undoubtedly be a factor of the highest importance if properly co-ordinated with the high-head high-level plants designed for primary power purposes.

Upon even a cursory analysis of the low-head low-level type of plants as built by the irrigation districts, it can be seen that they never contain the elements of a large power consuming district. They consist of areas of valley land irrigated from foothill storage by gravity and consequently are not candidates for electric power pumping as are other valley areas which are irrigated from sub-soil waters.

There is often an appreciable amount of auxiliary pumping required in local areas where ground water levels approach a dangerous height but this feature is a comparatively minor factor in the total electrical load. The only potential sources of considerable power usage are the small cities and towns which are located within the main agricultural areas, but which rarely, if ever, contain any of the heavy industrial elements that constitute the large consumers of electrical energy.

The irrigation districts are further at a disadvantage in attempting to secure a market beyond their own districts, first, due to the legal restrictions with which their powers are hedged, and secondly, due to their inability to meet large demands on account of the seasonal character of their output. These facts have been exemplified quite recently in the case of the Turlock Irrigation District which, in spite of an overwhelming sentiment in the community for the local consumption of its electrical byproduct, has found it a practical necessity to sell a large block of power to a public utility network, and has further found it a practical necessity to try to secure an electrical stand-by service to meet the obligations which they have incurred for power service and which it is difficult to meet at all seasons of the year due to the conditions of stream flow.

In the low-head low-level type of plant the generation of electrical energy follows closely on the demand for irrigation water and it, therefore, bears a definite relation to the water problem involved. If, therefore, a flexible and economic market can be provided for the electrical byproduct, then we have laid a foundation for the solution of the problem of water storage relations. It is not to be denied that fundamentally each class of property, both the privately owned hydroelectric plant and the politically owned irrigation plant must be operated largely in accord with the principles of local self-interest, and the solution of the problem lies in find-

ing some machinery that will permit the self-interest of each to be merged in a common and profitable channel. It is manifest that due to the complexities of the various interests that none but a state agency is capable of performing this co-ordinated function, and that if this state agency is to function completely it must, in this case, do more than regulate the market for electric power and must, to a very large extent at least, control the elements of production. The writer wishes again to quote from the article by Edward E. Carpenter:

"It is not at all likely that the development of these low-level low-head projects will be undertaken by the power companies; their interests will not lie in that direction. These developments will be progressively accomplished mainly, if not entirely, by irrigation groups as a matter of agricultural necessity. But their potential energy product, whatever amount it may be and whenever it may become available, must, as a matter of public economy be applied to the greatest extent possible to useful purposes. To meet this condition the widest possible market must be provided for its application and absorption. No condition of local usage will answer the requirements in this case and no market short of a great, combined, state-wide usage will suffice as a market reservoir capable of maintaining reasonable variations of level and permitting the greatest economic advantage being taken of these huge blocks of agricultural power.

"Not only must this broadening influence be applied to the power usage or power market phase of the problem, but a similar policy must be impressed upon the power production phase. The intimacy of these two elements of the power industry has been previously pointed out. With this in mind, it is obvious that adjustment or rearrangement of the usage phase must, as an inevitable complement, be reflected upon the production phase and that, in order to maintain the best balance between these two ultra-sensitive factors any agency empowered or authorized to control one part must of necessity have the same power to control the other.

"That this regulating adjusting function can be only carried out by a state governmental agency is obvious. But such an agency, in order to meet the requirements of the case, must be conceived and organized with a full comprehension of the problem to be dealt with and the conditions to be met."

The privately owned public utility companies of the Pacific Coast have already solved the problem of their mutual relationship in serving the various communities of that area by comprehensive systems of interconnections and the exchange of power in accordance with their individual requirements. This practice very measurably increases the stability of each company's service and the interest of the consumers is conserved through supervision by state public utility commissions of the terms of the interconnection contracts.

It is but a step from this arrangement to one which would also include the energy generated by political subdivisions and delivered by them into a general network. The generation of byproduct power has been of such recent origin that time has not yet developed a well defined principle for its utilization and a number of unsound theories have developed which are materially retarding the solution. There is undoubtedly a strong and widely held belief among the farmers of irrigation districts that the electrical byproduct is their own private matter and that no one on the outside has the right to interfere. On the other hand there is a growing public opinion which conceives that, as the irrigationists derive their special powers from the state, they should in turn render a service to the state through the beneficial use of their electrical byproduct, as they now render a service through the beneficial use of waters for irrigation. There is no questioning their prior right to stimulate, through the lowest sound rates, the fullest use of electrical energy within their own boundaries, but they owe a duty to the state to see that the residual energy be not throttled at the power plant or wasted by the establishment of uneconomic rates.

The public utility commissions of the various Pacific Slope states are peculiarly well equipped to handle the relations between private and political utilities because of the fact that most of the energy in this territory is generated by hydroelectric plants, and therefore the engineers of these commissions must be thoroughly informed on hydraulic problems as well as on the problems of electrical transmission and distribution.

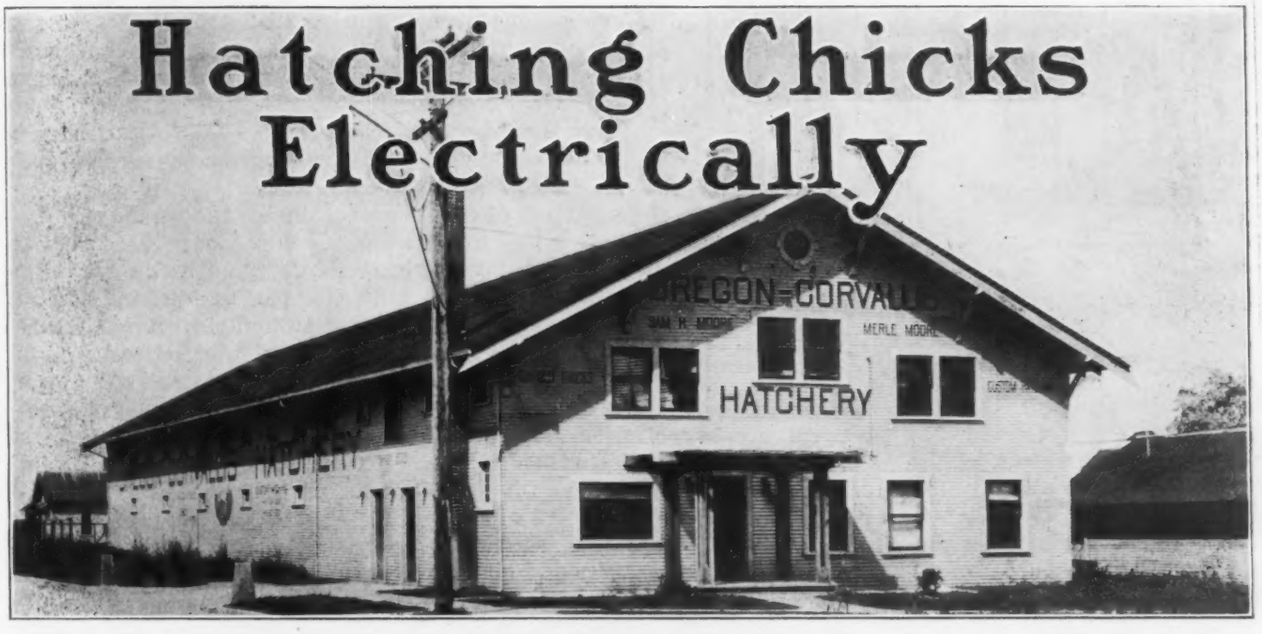
They would, therefore, grasp all the elements that enter into the mutual relation between a high-level plant and its storage for power purposes and a low-level plant and its storage for irrigation. If granted sufficient power they could equitably reconcile the interests of each and also the interest of the general public.

This plan would not mean that the public utility commission would in any way usurp the functions of state water commissions or of state engineers in determining the primary problem of establishing an irrigation district, but they would only enter into the problem and begin to function when the irrigation district had declared its intention of entering the power field by the establishment of a byproduct plant. This service, to be equitable and to conserve all interests within the state, would necessarily have to include byproduct plants such as are established by cities in developing a municipal water supply.

The objection will at once be raised that such a proposal could never carry, due to the resentment of municipalities in the encroachment of the state on their special powers, but on the other hand, with the ever increasing acuteness of water problems of the Pacific Coast, cities are now going into the remotest mountain areas and even into other states for an adequate water supply and an incidental electrical byproduct, and the encroachment, if any, is on the part of the municipalities with the people of the state largely holding the bag. All cities of a progressive character now recognize without argument that the conservation of the back country resources is fundamental to the city's ordered growth and it is, furthermore, generally recognized that if an agricultural area had to bear its proportionate share of the cost of electrical service, such service could no longer be considered as a farm adjunct or even as an amenity to life on the average farm.

The whole trend of public thought today is against the multiplication of further public commissions, but on the other hand, it is a well recognized fact that where existing commissions do function properly, it is most profitable for the states to employ them intensively through the principle of regulation as opposed to the principle of investing the state's capital in an enterprise that is not fundamentally a life and death matter to all the people.

Hatching Chicks Electrically



By Harold E. Bell
Electrical Engineering Department,
Oregon Agricultural College, Corvallis, Ore.

NO industry has been improved more in its own scope and sphere than artificial incubation. Although the art of incubation of chickens has been known to the Egyptians and Chinese from time immemorial, the improvements of the machines have taken place within the last forty-five years. The incubators a few years ago used the kerosene lamp for the heating of water, which in turn heated the egg chamber. This method has gone through many changes and the oil lamp, the gas lamp, and the coal stove machines are still in use, but the electric incubator is fast replacing these older methods in most large installations and is now widely used for general incubation.

The electric incubator has proved very satisfactory in commercial hatcheries because of certain important advantages it possesses over other types of incubators. The electrical method is cleaner because no fumes are given off; it is as economical as other means of heating since the greater cost of heat energy is compensated for by the lower cost of labor. The fire hazard is greatly reduced by the elimination of elements which become hot enough to ignite wood and the cleaning and filling of lamps and the taking of numerous thermometer readings are eliminated. One of the many electrically equipped incubators on the Pacific Coast is that of the Oregon-Corvallis Hatchery, at Corvallis, Ore. This plant has a capacity of 80,000 eggs at one hatching and has been in operation for two years. The following data tests are based on this installation—the test data being taken during the period from Jan. 26, 1924 to May 1, 1924.

Hatchery Equipment

The plant consists of a wooden building 44 ft. x 150 ft. which contains 131 incubators with a capacity of 612 eggs each. Double walls packed with sawdust for heat insulation are used and the floor is covered with dirt and a layer of sawdust and shavings to reduce heat radiation. The incubator room has only a few small windows to further keep down heat losses. The building is heated by the incubators alone, and as the room is well insulated the temperature varies over the very small range of from 60 to 70 deg. F.

All of the incubators in the plant are heated electrically and the source of power is easily changed from the central station service to a gas engine driven generator which insures a constant supply of power. Each machine is fed by drop cord from the ceiling. Groups of six machines are served from one feeder and each feeder terminates in the main distribution cabinet with a fuse block and a switch for protection and control. Power for the plant is supplied from a three-wire 110-220-volt circuit. The auxiliary power supply is furnished by a 25-kw., d.c. generator driven by an automobile engine. This generator is not large enough to carry the entire plant but 42 to 48 incubators may be operated from it at one time and by changing every ten to fifteen minutes this is sufficient to keep all incubators up to constant temperature. A protective device is installed in conjunction with the main switch service to give warning of a power failure. An electromagnet holds a battery bell circuit open against gravity, so that when the voltage drops below normal the bell circuit closes and sounds an alarm.

Each incubator is heated by ten Petaluma Incubator Company elements each having the following characteristics: Size of wire, No. 20 B. & S. gage alloy wire; length of wire, 9.5 ft.; resistance at 20 deg. F., 2.83 ohms; resistance per mil foot, 303 ohms; full load current, 4 amp. The elements are placed in the top of the incubator and are spaced 7 in. center

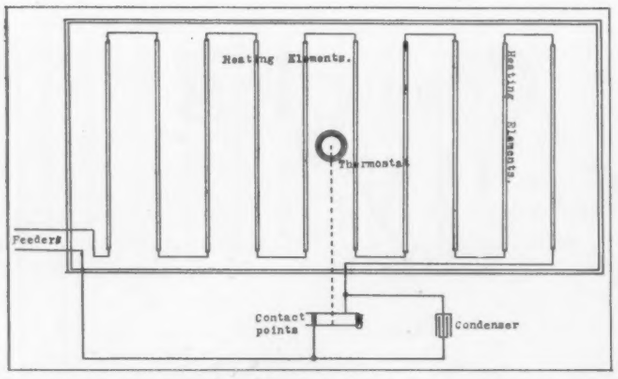


Fig. 1 showing the electrical circuit of one incubator.

to center with 6 in. from the end elements to the end of the compartment. The electrical circuit for one incubator is shown in Fig. 1. The contacts are controlled by an ether wafer thermostat. A condenser is supplied to quench the arc and prolong the life of the contacts when the auxiliary d.c. service is used. If both sources of power were a.c. the condensers would not be necessary.

A test was made on the plant for determining the cost per hatch, cost per hundred chicks, and the power consumption of the machines. Three methods of test were used to obtain the desired data. In the first a graphic recording wattmeter was installed on a group of six machines to show the variation of power consumption. The chart from this meter showed that the power in each individual machine was on for very short intervals of time only. The current in no one machine remained on for more than a minute to a minute and a half with the exception of the time necessary to reheat the eggs after cooling or turning. During such periods the current remained on for an hour at a time. The chart also showed that the power consumption began to drop off on the fourteenth day. This is due to the fact that the growth of the germ at this period begins to use the latent heat stored within the egg.

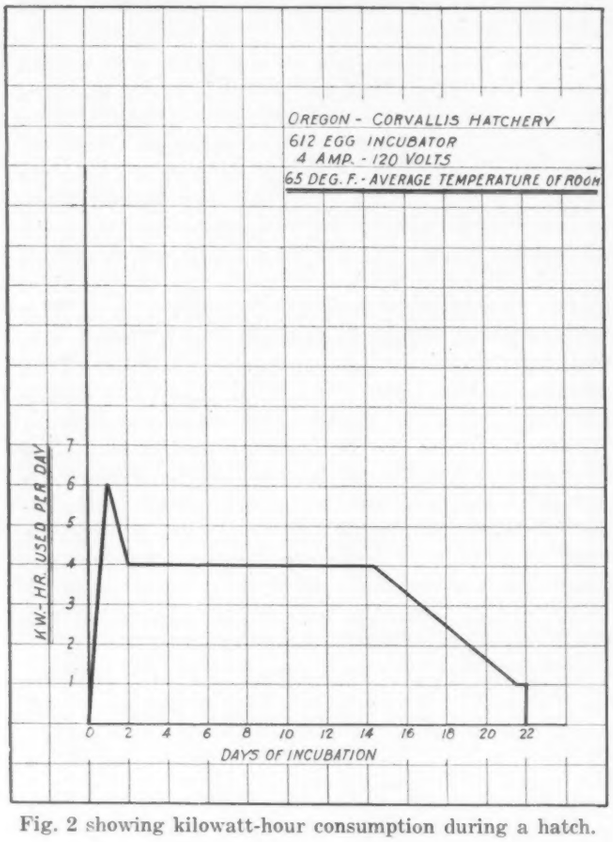


Fig. 2 showing kilowatt-hour consumption during a hatch.

A characteristic curve of the kilowatt-hour consumption of one incubator during the period of incubation is shown in Fig. 2. The energy used during the first day is relatively high on account of the initial heating of both the incubator chamber and the eggs. The daily consumption then remains constant at 4 kw-hr. per day until the fourteenth day when the formation of the chick reaches the stage in its development where it does not require as much artificial heating. From this time on until the chick is hatched, the consumption gradually falls off and drops as low as 1 kw-hr. per day with a room temperature of 65 deg. F.

A second test consisted of obtaining recording voltmeter charts for a period of two months to determine the voltage regulation and the number of interruptions to service. It was found that the power went off on an average of once in every three days, but only once a season for a long enough period to require the starting of the emergency plant. The average duration of the interruptions was from five to eight minutes. The voltage had about the same characteristics from day to day with a maximum of 122 volts and a minimum of 114 volts.

A third test was made with four recording watt-hour meters on four different incubators in different parts of the plant. The kilowatt-hour consumption of each incubator per day and per hatch was determined from these meters. It was found that the temperature of the room affected the consumption of power materially. This is shown by the curves plotted on cost per hatch against cost per kilowatt-hour at different temperatures, and is brought out in Fig. 3 and Table I. The results of the test were as follows:

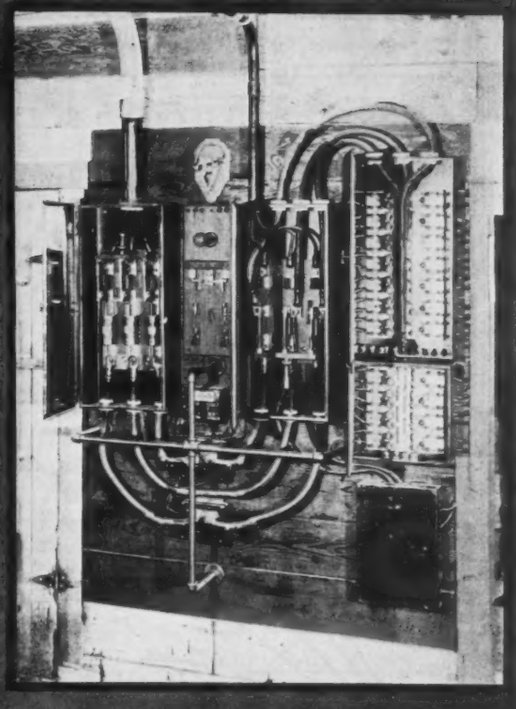
TABLE I.—COST PER HATCH IN DOLLARS

Power Cost per Kw-hr.	Average Room Temperature During Hatch 50 deg. F.	60 deg. F.	70 deg. F.	80 deg. F.	90 deg. F.
1	$1.00	$ .80	$ .60	$ .45	$ .35
2	1.95	1.60	1.25	.85	.50
3	2.95	2.40	1.80	1.30	.70
4	3.90	3.20	2.40	1.70	.80
5	4.85	4.00	3.00	2.10	1.20
6	5.80	4.70	3.60	2.50	1.45
7	6.85	5.60	4.30	2.95	1.70
8	7.70	6.30	4.85	3.35	1.90
9	8.70	7.10	5.50	3.80	2.15
10	9.70	7.90	6.10	4.20	2.40
11	10.70	8.70	6.70	4.60	2.60
12	11.10	9.50	7.30	5.00	2.90
13	12.60	10.30	7.90	5.40	3.10
14	13.55	11.05	8.50	5.85	3.35
15	14.60	11.90	9.10	6.30	3.60

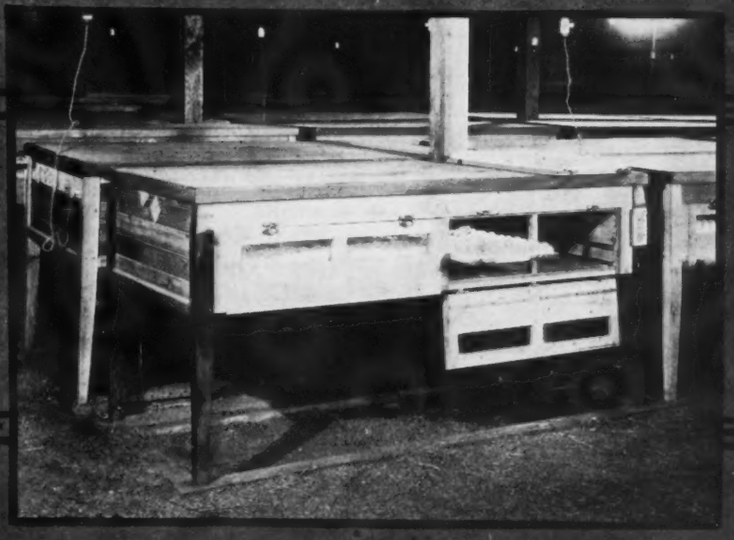
Number of incubators	131
Egg capacity (per machine)	612
Egg capacity (total)	80,172
Connected load	61.9 kw.
Connected load (per machine)	475 watts
Maximum monthly kw-hr.	14,160
Maximum monthly power bill	$354.90

Costs

Cost per hatch of chicks, power	$1.90 to $2.10
Cost per hundred chicks, power	.50 to .58
Cost per hatch of chicks, power and labor	4.35
Cost per hundred chicks, labor and power	1.20



ARTIFICIAL incubation with electricity furnishing the heat has made rapid strides at the Oregon-Corvallis Hatchery, views of which are shown. At the top is the interior of the hatchery with its batteries of incubators. At the right is the main service panel, showing, in the center, the alarm system which indicates an interruption of service. Below is a closeup of one of the incubators



In the two columns in Table II, giving the percentages of chicks that hatched, one percentage is on the basis of the total egg count, while the other is on the basis of the fertile egg count. It is obvious that only a fair average of eggs hatched can be obtained by the hatchery because of the loss due to the unfertile eggs, caused by injurious jarring in delivery. Another reason for the large percentage of unfertile eggs received is the method of changing the food which is used.

TABLE II.—PERCENTAGE OF CHICKS

Number of Eggs	Number of Unfertile Eggs	Number of Fertile Eggs	Number of Chicks	Per Cent of Chicks Based on Total Eggs	Per Cent of Chicks Based on Fertile Eggs
612	101	511	354	57.8	69.3
612	73	539	402	65.6	74.6
612	70	542	396	64.7	73.0
612	89	523	327	53.4	62.5
612	100	512	380	62	74.2
612	71	541	382	62.4	70.6
612	51	560	338	55.1	60.4
612	62	550	406	66.3	73.8
Ave. 612	77.2	535.4	373	60.0	69.8

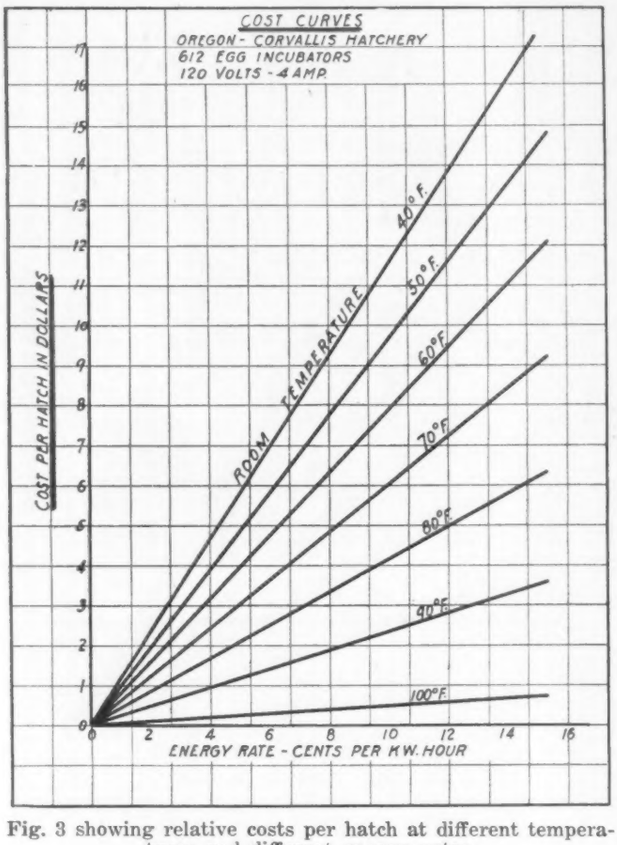


Fig. 3 showing relative costs per hatch at different temperatures and different energy rates.

In Fig. 3 is shown the cost per hatch at different rates per kw-hr., and at different room temperatures. If the temperature of the incubator room is high the amount of power used by the machines in operation is lowered. There are three factors entering into the consideration of the proper maximum temperature for the room; first, the most satisfactory temperature for cooling the eggs, second the temperature under which it is possible for men to work comfortably, and third, the temperature adapting itself to most efficient ventilation.

During the period of incubation the eggs must be cooled down to 98 deg. F. several times and therefore to secure economy of time in the egg cooling process, the room temperature should not be above 95 deg. F. To insure the supply of men for employment in the hatcheries for reasonable wages, the temperature of the incubator room should be somewhat lower than 95 deg. and an average of from 85 to 90 deg. F. has been found best.

The third and most important factor to be considered is that of ventilation. It has been shown by experimentation that when the temperature of the incubator room is raised to 85 or 90 deg. F. the ventilation in the type of incubator manufactured today becomes inefficient. However, a study of Fig. 3 shows that a large saving in the cost of power per hatch is accomplished by having the room temperature high. This saving could be effected in the same manner by heating the room with some cheap fuel, but this would necessitate forced ventilation of the machines. Poultrymen agree that because of insufficient ventilation, and the burning of oxygen from the air by the room heater if fuel fired, the incubator rooms cannot be heated to a high temperature if the best results in hatching are to be obtained. However, the combination of forced ventilation and high room temperature has not, as yet, been attempted. Forced ventilation would obviously do away with these difficulties as it would replenish the supply of oxygen in the air and would provide fresh air at a warmer temperature for the eggs.

The minimum temperature is governed by the factors of freezing, storing and cooling of the eggs. The temperature at which eggs freeze is 28 deg. F. and the temperature at which incubation begins to take place is 68 deg. F. In case the incubator room is used for storing the eggs for the next hatch, the temperature must therefore be above 28 deg. and below 68 deg. F. The standard storing temperature is 55 deg. F. In cooling the eggs during the period of incubation the temperature of the room must be high enough to insure the even cooling of the whole egg to 98 deg. F. instead of the shell only.

Another feature of electric incubation upon which experimental study could advantageously be undertaken is that of the most desirable capacity of the heating elements. Would it have been detrimental to incubation if the 475-watt machines under test had been equipped with smaller capacity heating elements? One advantage of the smaller capacity element from the electrical standpoint would be a decrease in maximum demand of the plant, and an increase in the load factor, both of which would result in a lower rate per kw-hr. In cases where all machines are in operation at the same time, as they are for a very short time when the eggs are being cooled or just after a ten or fifteen minute interruption to service, the maximum capacity of the heating elements is used for a very short period only. If the machines were using a smaller heating element, say 300 watts, the maximum demand would be 37 per cent less, and likewise all equipment could be 37 per cent smaller.

Some Timely Comments Concerning Electrical Advertising

By Herbert Rose
Federal Electric Company, San Diego, Calif.

INCLUDED among the many benefits to be derived from actively pushing the electric sign business are increased business to the user, increased revenue to the central station, more work for the contractor and the manufacturer, higher rental value to the building owner and the general improvement in the appearance of the business section of the city itself. In this article Mr. Rose discusses all of the various phases of electrical advertising with special emphasis on electric signs.

THERE are many kinds of electrical advertising, and even some of the things which we are accustomed to classify otherwise, are in purpose and effect, advertising. For instance, ornamental street lights are ostensibly for the purpose of illuminating streets to facilitate vehicle and pedestrian traffic. However, their real purpose and effect is advertising. They emphasize for the stranger the thoroughfares that are most worth while to travel, namely, those that are most intensively merchandising thoroughfares. It is on these streets that he will expect to find the shops of importance that merit his patronage. They mark, in a vivid way, the territory which he may safely figure is the desirable section to consider if he is starting to investigate a location for a retail enterprise of his own. Even to the people who are at home in the town in question, they produce the same effect. They advertise the district illuminated and the establishments therein, and even more, the whole city by contrast with neighboring cities not so well provided. Thus they advertise the city, the specific district, and the merchants there.

Show window lighting does for the merchant in a district what street lighting does for the whole district. His windows attract. His establishment and merchandise, which, no matter how meritorious, would otherwise receive only part of the attention due, are favorably and forcefully brought to the attention of his prospective patrons in a measure directly proportional to the effectiveness of the illumination. The proprietor of a store closed during the evening hours understands the fact that evening window shopping is a preliminary to actual day buying. Thus, effective window lighting advertises the establishment and the district.

Flood lighting or outline lighting of a building or group of buildings constitutes other means of attracting attention for the purpose of creating more interest in an office or store building, thus advertising it to the extent of improving its rental value. These methods are also effective in drawing attention and consequent patronage to places of amusement, etc.

Carnival lighting, either on land or water, has the same advertising value, even though for a limited time only during its use.

Moving displays attract more attention than stationary ones, so we have another class of advertising in show windows or public places, in which electricity for motive power instead of illumination plays its part in advertising.

Electrical advertising signs constitute another form, and in the discussion that follows, the writer has in mind particularly electrical advertising signs, for the reason that this form combines all of the features and benefits of all of the other forms of electrical advertising.

There are many kinds of electrical signs each with a field of its own. The large and elaborate displays, usually on a roof or large exposed wall, constitute a type warranted for the purpose of general publicity in localities where traffic is intense, that is, where the circulation justifies the expense involved in a large display. These signs are also appropriate in establishing, as a landmark, some extensive installation in a location of considerable traffic, or for a similar purpose, on a factory or warehouse located on a prominent vehicular, rail or water highway. The effect in such cases is to advertise by emphasis the size or caliber of the structure, and indirectly create a favorable impression of the enterprise there housed, and produce other general benefits. This class of sign, in addition to calling for specialized ability to design and construct attractive displays, also requires the engineering abilities of structural designers and extensive manufacturing facilities to produce the structures to safely harmonize with the existing structure and properly support the display.

There are also numerous types of smaller signs intended for indoor use in show windows, stores, lobbies, etc., for delivering advertising messages in a forceful manner, and for directing traffic.

As representing the installations most generally found profitable in the greatest number and variety of businesses, there is the class of sign used on building fronts and mounted at right angles to the traffic, to reach two or three blocks in each direction. Such signs must come within the limitations of local ordinances. Usually these ordinances are drawn with

the intention of insuring a reasonable distribution to all who care to derive the benefits of electrical sign advertising; also to see that the sign user contributes a reasonable amount of illumination to the streets in exchange for the franchise of using the space over the walks; and finally to provide for the safety of the public. Most progressive city officials see the wisdom of encouraging electrical advertising signs, imposing only such regulation as is necessary to accomplish the purposes mentioned before. The well established manufacturers, having reputations to maintain, are usually willing and anxious to cooperate with the city officials in the accomplishment of these results.

In the class of sign just described, there are two types: one in which the letters and characters are formed of exposed bulbs, and the other in which the source of illumination is within the sign, and the letters and characters are formed of translucent material. The former has the advantage of contributing more to the general illumination of the vicinity, while the latter is more effective in cases where there are relatively small letters.

Good Appearance Increases Value

All parties involved are interested in encouraging the use of those materials and types of construction that stand the ravages of weather, both for the purpose of maintaining the structure in good condition, and what is more important from an advertising standpoint, for the purpose of maintaining the appearance. The latter determines whether or not the sign will permanently create a favorable impression. The sign's advertising value decreases rapidly if it does not continue to create a favorable impression, and may even reach a point where it does just the opposite. One material that has been demonstrated to fill the requirement of permanently retaining its original condition is a heavy gage of steel, on which there are fused several coats of porcelain of natural color. This material retains its color and surface brilliancy permanently, against all weather conditions, consequently retaining the advertising value permanently. There are installations of this class of material in use today retaining at full advertising value the appearance they had when originally installed over twenty years ago, and that with no maintenance except an occasional washing. Most other kinds of surface finishes, depending upon paint, are effective only temporarily or require considerable maintenance which they seldom receive from the average advertiser who has no facilities or inclination toward such maintenance.

Governing the effective life of the sign, there are many other mechanical and electrical details such as the choice of the proper type of weatherproof sockets; methods of connecting same; the design and assembly of frames and structures of proper strength; the use of proper gage of metals and methods of making the seams; the methods of making electrical joints; methods of weatherproofing all the parts; methods of providing access to lamps for renewal and to surfaces requiring cleaning; and many other details known to those with the wide experience necessary to learn all these factors and their importance.

Governing the effectiveness, from a display standpoint, experience has demonstrated the importance of such features as the choice of effective color combinations; the choice of size of characters, and the spacing thereof; the proper proportioning of message and decorative effects; the choice of system of illumination, determined by space available and amount of reading matter; size, type, and spacing of the illuminating units; method of producing moving effects; proportion and shaping of letters and characters, and the proper materials for forming them; and many other features.

So much for a brief synopsis of kinds, purposes, and features governing the effectiveness of electrical advertising. Now, as to the benefits to be derived from its use.

Benefits to the User of Electrical Advertising

The user comes first in the discussion of the benefits for the reason that he foots most of the bill and derives most of the direct benefit. No one could conscientiously urge the use of electrical advertising if it were not evident that the user benefits. It is an accepted fact that well directed advertising in general pays, and that there are practically no conspicuous successes in commercial enterprises in which advertising did not play an important part. There are many effective forms of advertising, and no one form can be said to be best for all purposes. However, there are few kinds of enterprises that can afford to overlook the benefits to be derived from electrical advertising, as exemplified by electrical signs, for instance. Let us see why they can reasonably be expected to produce the desired results.

Based upon figures obtained from traffic counts, it has been shown that the electric sign on a retail store, for example, reaches more people per year per dollar spent than does any other recognized medium. The message, although general in its nature, can be effectively supplemented by other forms of publicity, giving seasonable or timely detailed information (although even this feature may be accomplished by certain forms of signs arranged to be easily changed as to their reading matter). However, the sign has this combination of desirable features not possessed by other kinds of advertising. It reaches the prospective customer at a place where he can conveniently investigate further what the advertiser has to offer. Thus the impulse that it creates is more likely to produce the direct contact desired by the advertiser (and the consequent greater chance for an actual sale) than an impulse created at some remote place, and at some less opportune time. At the same time the sign brands into the mind of the public the advertiser's location, and helps the public find him later at some more opportune time, if not at once.

The electric sign, after being once properly designed and installed, is working continuously every hour of the year. Incidentally, besides burning its message into the subconscious minds of the passers-by, it is contributing to the illumination around the

premises, which illumination in itself has considerable advertising value. The user's frontage is automatically extended to many times the actual frontage on which he pays rent by the fact that his store location is visible for a considerable distance either way from his actual frontage. Retail dealers have stated that their electric signs on side street locations have kept them in contact with traffic on main streets where rentals are several times as great. A chain of cigar stores using interchangeable letter signs in which the message is changed at intervals alternately featuring different brands, shows by its accurate records, an increase of an average of 25 per cent on sales of the brand currently advertised as compared with sales of the same brand during a period when that brand was not advertised on the sign. The value of the advertising in that case is in the control of the demand in the desired channels, as well as the general increase in volume. Another evidence of the regard advertisers have for their signs is the wave of protest heard whenever, for purposes of conservation, it has been necessary to curtail the burning of sign current during emergencies.

The greatest benefit in direct sales comes to the merchant catering to the impulse purchase, because his sign, by the power of suggestion, creates purchase impulses that might otherwise lie dormant and in addition directs the purchase impulse thus created to his store instead of to a less conspicuous competitor, with the direct result of sales. The merchant catering to the so-called deliberate purchase may not get such quick or direct action from his sign, but the same principle applies to him in the same manner that "constant dripping wears a stone."

Many years ago the electric sign was considered only as a novelty, but the factors previously mentioned have been so thoroughly demonstrated that there has been a constantly increasing use of electric sign advertising, particularly by those classes of business that are in the habit of systematically studying the actual net profits obtained by various forms of advertising. This is perhaps the most conclusive of all the reasons mentioned to show that the user benefits.

Benefits to the Central Station

The most obvious benefit to the central station is the revenue from current consumed by the sign. That alone is a large item in the aggregate. Also, the merchant who burns a sign finds it profitable to burn more show window lights and burn them longer in view of the fact that his sign is attracting more people to the windows, warranting a more intensive use of the windows—more revenue to the central station for current consumed.

There is another benefit, not so obvious. The various forms of electrical advertising, while they are advertising merchandise and service of various kinds, are, by force of example, advertising the use of electricity.

Central stations are themselves among the most conspicuous users. They find electrical displays effective in emphasizing their plants and conspicuous properties for the purpose of reminding their customers of the extensive provisions that have been made for supplying service, thus suggesting the increasing use of that service. Such displays are also impressive to the prospective purchasers of the securities of the utility companies.

Benefits to the Electrical Industry

Each display calls for the employment of various electrical crafts in its assembly. It provides employment of electrical crafts in the manufacturing of the basic materials such as wire, sockets, fuses, lamps, flashers, etc. It calls for the services of electrical contractors in the installation and service wiring, and corresponding use of additional electrical materials such as wire, conduit, switches, fuses, renewal lamps, etc. The benefits reach directly and indirectly through the whole electrical industry.

Benefits to the Property Owner

In the case of tenants using electrical advertising, the property owner enjoys a benefit. His structure is enhanced as to rental value, due to the added appearance of activity, and indirectly due to the increase in business resulting to his tenant, which has a real bearing upon the rental value.

For this reason, building owners have found it profitable to install, for their own account, electrical displays emphasizing their buildings even though fully occupied, as the rental values are proportional to the excess of demand for space over the supply. Obviously, it pays a building owner to have a waiting list of prospective tenants.

The Benefits to the Neighborhood

All merchants in a given neighborhood profit by the popularity of the neighborhood. The traffic which a merchant brings to his own store is an asset to his neighbors, so we find a community interest. This is particularly true of the outlying business sections. A neighborhood shopping district takes on the "down town" atmosphere when it uses the "down town" methods of attracting business, which it must do to solve the ever present problem of sharing with the down town district the patronage of the neighborhood people.

Advertising in the outlying sections is more conspicuous by reason of relatively fewer competing displays as compared to the down town district, thus smaller expenditures suffice for corresponding emphasis.

Benefits to All

All of the other benefits mentioned act in a cumulative manner to the common good. Increased business to the user, with consequent greater profit to contribute to the general prosperity; increased revenue to the central station, calling for increased dividends to its shareholders; more revenue to the electrical contractor to pass on to his employees to put into circulation; more rental value to the building owner to encourage him and others to build more buildings, with all the incidental additional money put into circulation; new settlers attracted by the live appearance of the town, by contrast with less brilliantly advertised competing towns, with the consequent added influx of new enterprise, and its chain of benefits.

The New Norwegian Electric Pig Iron Furnace

By Frank Hodson[1] and Dr. M. Sem[2]

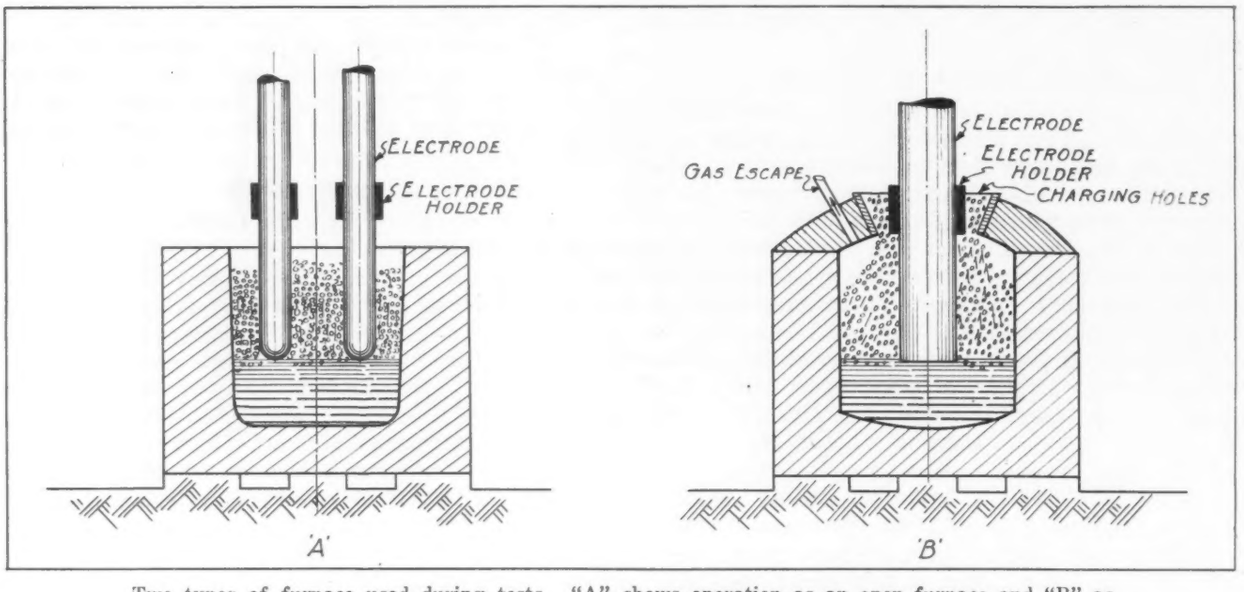
WHILE Norway has been famous for centuries for the high quality and purity of its iron, it was not until 1910 that iron was produced commercially by electric smelting. The Tinfos Verk and Elefos Jernverk at that time installed simple monophase pit-type electric smelting furnaces using coke as a reducing agent and produced about 10,000 tons of pig iron a year.

Originally these furnaces were provided with two sloping shafts, one on each side of the carbon electrode, but as these did not prove satisfactory for removing the gases generated, these were finally allowed to burn or escape. The furnaces were not efficiently operated in this way and little or no progress was made until 1920 when the Norwegian government decided to appropriate the necessary money for the running of a 600-kva. electric smelting furnace using the Soderberg self-baking electrode. This electrode consists of a metallic casing with inside fins of metal—the raw electrode mix consisting of coke, anthracite, pitch and tar being slightly heated and rammed into the metallic casing. The electrode is then ready to use. The fins, casing and the mix carry current until the electrode is baked and then the operation is continuous, new pieces of electrode being welded on from time to time. The electrodes are not limited either in size, length or shape and they are superior to ordinary carbon electrodes in electrical conductivity so that a current density as high as 11 amp. per sq. cm. (corresponding to approximately 70 amp. per sq. in.) is easily possible. The size of the furnace is not limited as with earlier monophase furnaces, single, two or three-phase furnaces being practical.

The furnace was put in operation in July, 1922, and ran continuously until Jan. 6, 1924. The report on its operation has caused wide comment in Norwegian iron circles and while electric smelting of iron ore may not compete with blast furnace iron in the United States, the results are sufficiently interesting from the standpoint of a new development to merit consideration. There are places in the United States, including the Pacific Coast states, in Canada and in South America rich in cheap hydroelectric power where coal and coke are expensive and ore plentiful, that are watching the Norwegian experiment with considerable interest. The plant of the Campanhia Electro-Metallurgica Brasiliera already has two large electric smelting furnaces in operation and it is estimated that over 120,000 kw. of electric smelting iron furnaces are in operation in various parts of the world.

During the test all kinds of ore were used, including concentrates, sinters and lumy ore. In some cases the content of concentrates was as high as 66 per cent without causing special difficulty. Both charcoal and coke were used as a reducing agent—the former working so smoothly that coke and coke breeze were used most of the time in order to make the operating conditions as difficult as possible. During the test 1,300 tons of pig iron were produced, one-third being sold to foundries and the balance to

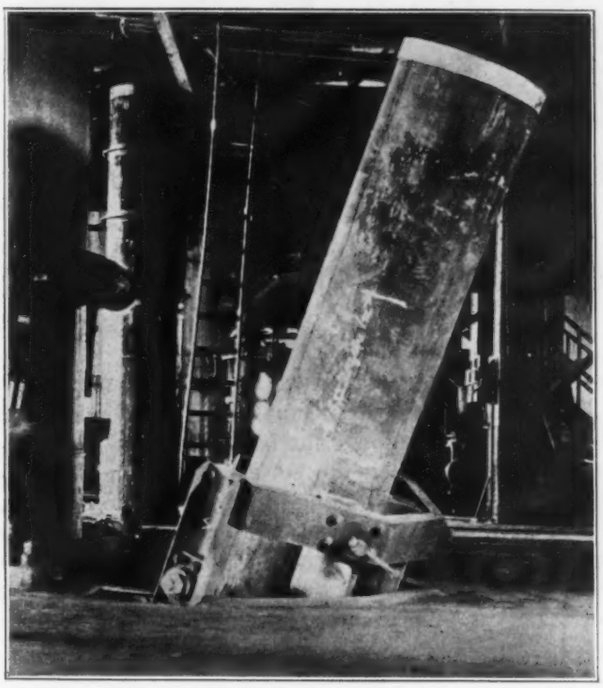
[1]President, Electric Furnace Construction Company, Philadelphia, Pa.
[2]Metallurgist, Electrokemisk Industri, Kristiania, Norway.



Two types of furnace used during tests. "A" shows operation as an open furnace and "B" as closed furnace with vents for removing gases.

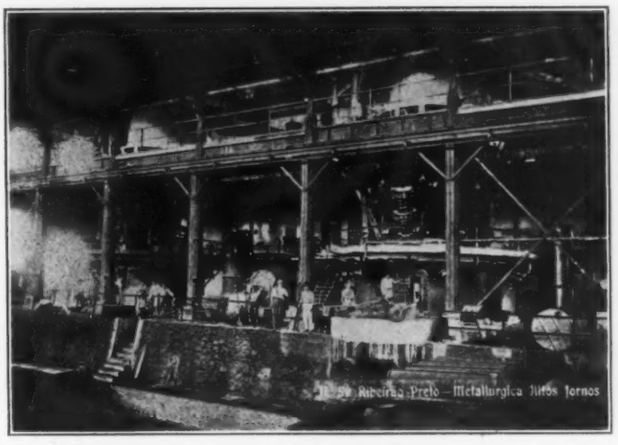
a steel plant for use in open hearth furnaces. Both gray and white iron were produced at will.

The furnace used was a pit type with electrodes hanging vertically into the furnace crater. The run



A 26-in. Soderberg electrode in a 4,000-kw. electric pig iron furnace in Norway.

was divided into three periods. During the first the furnace was operated as an open-pit type with one top and one bottom electrode. During the second the electrodes were both on top. For the third and most successful test the furnace was closed with a brick roof, provided with a charging shaft around the



Two 3,000-kw. "Electrometall" type electric iron ore smelting furnaces now operating in Brazil.

electrode and equipped with pipes for collecting the gases. During all of the tests the electrodes were charged with 11 amp. per sq. cm.

The consumption of power, coke and electrode varied with the different kinds of coke and coke breeze and also with the grade and kind of iron made. A fairly good grade of ore gave the following results:

For each ton of pig iron produced
2,600 kw-hr. were used
380 kg. of 85% carbon coke were used
8 to 10 kg. of electrode were used

A summary of the advantages of the new furnace over the older types as brought out by the tests showed:

1. Cheaper operation—two workmen ran the trial furnace.
2. Cheaper and simpler installation—a 10,000-kw. furnace requires but three electrodes.
3. Any raw materials may be used (powdery ore, iron sands, coke breeze, etc.).
4. Load of the furnace can be varied as and when required.
5. Can use either charcoal or coke economically.
6. Operation of the electrode continuous—no breakage, greater power input into furnace, increased production, much cheaper than carbon electrode.

The first result of the experiment has been the construction of a 4,000-kw., three-phase furnace of this type for the Christiania Spigeverk, Kristiania, Norway. The results of this installation will be watched with a great deal of interest.

Japanese Government Will Electrify Tokaido Railway Line

AT a recent Japanese Imperial Government railway conference held in Tokyo a program was approved for the electrification of the Tokaido railway line between Tokyo and Akashi, according to advices sent to the United States Department of Commerce by Assistant Trade Commissioner Phillips. The money for electrification work was appropriated some time ago and the recent conference had for consideration only the development of a definite program.

The work under consideration at the present time consists of the portion of the Tokaido line extending from Numazu to Akashi, a distance of approximately 300 miles. This work, not including the cost of locomotives, is estimated to require the expenditure of about 21,983,000 yen (approximately $10,700,000).

In addition to the electrification of the Tokaido line, the Japanese railway department has already prepared tentative plans for electrifying both the central and the northern lines.

While the foreign electric locomotives have so far dominated the field, at least one Japanese company is active in competing for this particular class of business. A trial locomotive has recently been completed and tested by the Hidachi Engineering Works, which in design embodies many features introduced by American manufacturers. According to reports, this Japanese trial locomotive has given good results in the recent test.

The COAST Outlet
ELECTRICAL CONSTRUCTIONISTS' and DEALERS' NEWS

Electrical Construction

By E. Earl Browne

WHEN estimating a job, if the contractor should find that a riser plan is not given it is a good idea for him to make a rough plan (not to scale) of his own. In this way he is able to check against the omission of feeders, sub-feeders, motor circuits, sign circuits, signal transformer circuits, etc. By using such a plan it is possible to check on the main service switches, distribution switches, panel boards, motor circuit switches, etc. This is essential for it is an easy matter to overlook some costly items if reliance is put in memory only. This is particularly true of a plan for a building in which there are to be a number of tenants with separate metering for lights, power and heating in addition to the general building lighting and power work. In figuring on such a job, the contractor must remember that to comply with the rules it is necessary to install general lighting and power disconnect switches in a manner similar to that shown in Fig. 12.

SERVICES AND FEEDS AND SUB FEEDS

FROM	TO	Dist. Cond. Ways	WIRE No.	WIRE Size	CONDUIT ½"	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	WIRE No.14	No.12	No.10	No.8	No.6	No.4	No.3	No.2	No.1	1/0	2/0	3/0	4/0	400M	600M
Main Light Service		20	3	400M								20																75	
Main Power "		30	3	600M									30																105
" Bd. Emerg. Panel		70	3	8			70											225											
" " Base "		40	3	12		40										135													
" " 2nd. Fl."		70	3	6				70											225										
" " 3rd, " "		83	3	6				83											264										
" " 4th " "		96	3	6				96											303										
" " 5th " "		109	3	6				109											342										
" " 6th " "		122	3	6				122											381										
" " Store #1 "		50	3	6				50											165										
" " " #2 "		40	3	6				40											135										
" " " #3 "		65	3	6				65											210										
" " " #4 "		78	3	10		78											249												
" " " #5 "		96	3	10		96											303												
" " " #6 "		124	3	10		124											387												
Sign " #1 "		46	3	12		46										153													
" " #2 "		36	3	12		36										123													
" " #3 "		48	3	12		48										159													
Main Bd. Pass Elev. Rent.		126	3	0000								126															393		
Pass. Elev. #1 " "		"18	3	0						18													69						
" " #2 " "		"18	3	0						18													69						
Main Bd. Frt." "		"164	3	1					164													507							
" " S.W. " Base		64	3	10		64											207												
" " Vacuum "		34	3	8			34											117											
" " Boiler Rm.		26	3	12		26										93													
Oil Set #1 " "		25	2	12	25											60													
" " #2 " "		30	2	12	30											70													
Main Bd. Deep Well		62	3	6					62										201										
Roof Tank " "		178	2	12	178											366													
TOTALS					233	558	104	697	164	36	126	20	30		1159	1146	342	2226				507	138			393	75	105		

Fig. 13

All services, feeders, sub-feeders and motor and other special circuits should be listed on a form such as shown in Fig. 13 and by checking the riser diagram against the items found on the floor plans and listed in the form there is less chance of error.

In totaling the wire length for each separate run 5 ft. should be added to the conduit length in order to take care of connections in cabinets, switches and the incidental waste.

In this form it is contemplated that the material items are listed separately instead of consolidated as shown in the discussion of this subject in several of the past articles in the Journal of Electricity. It is also assumed that the feeders and sub-feeders are run in separate conduits as some departments of electricity do not permit them being run together due to the fact that in these cities two or more power companies often serve the same building and if at a later date a tenant should change to the other company it would mean that the conductors for two separate systems would be in the same conduit and therefore in conflict with Rule 26-P, last paragraph of the 1920 National Electric Code, and Rule 503-J of the 1923 Code.

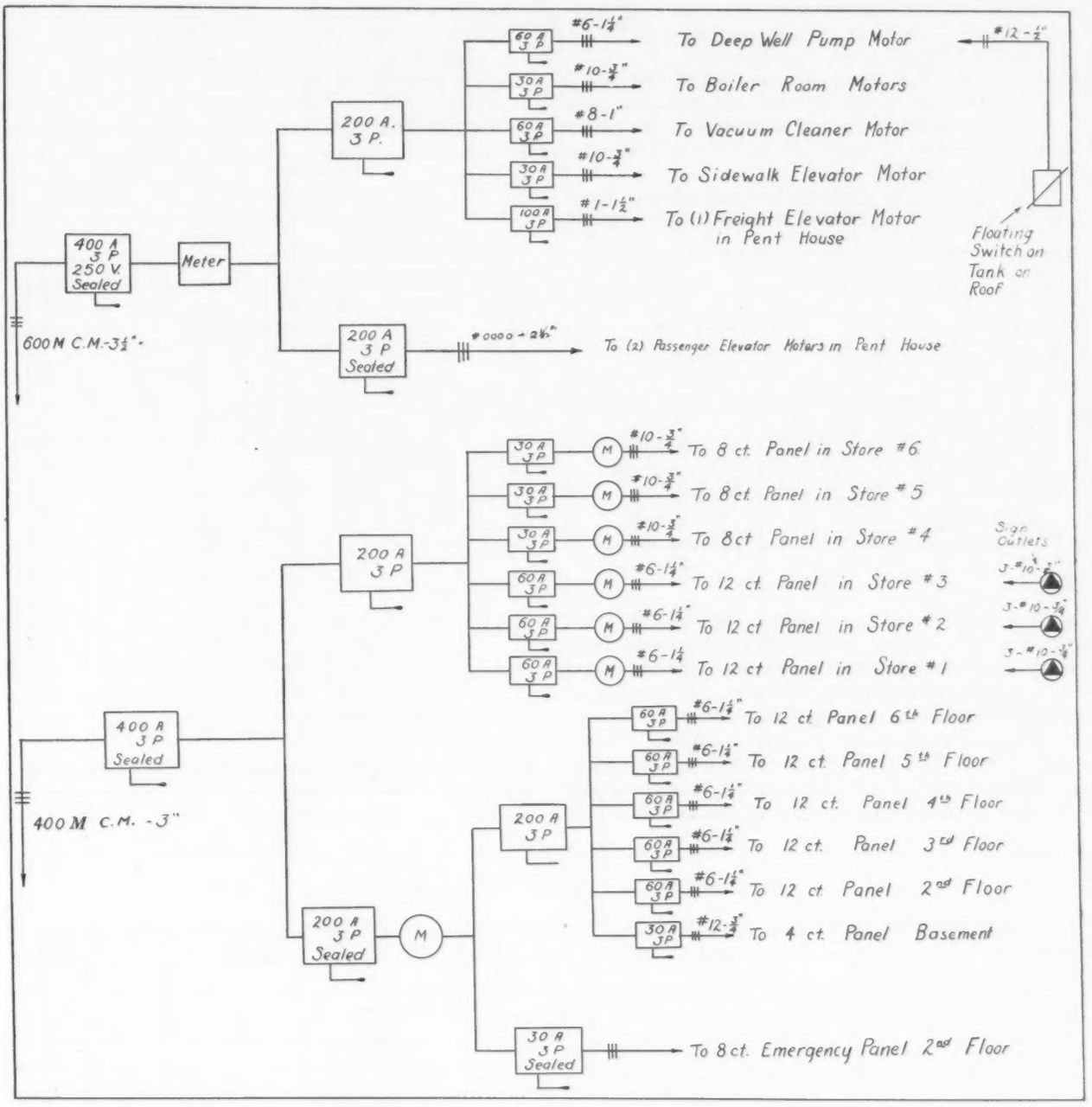

400 A 3 P 250 V. Sealed
Meter
600 M C.M.-3½"
200 A. 3 P.
60 A 3 P
#6-1¼"
To Deep Well Pump Motor
30 A 3 P
#10-¾"
To Boiler Room Motors
60 A 3 P
#8-1"
To Vacuum Cleaner Motor
30 A 3 P
#10-¾"
To Sidewalk Elevator Motor
100 A 3 P
#1-1½"
To (1) Freight Elevator Motor in Pent House
#12-½"
Floating Switch on Tank on Roof
200 A 3 P Sealed
#0000-2½"
To (2) Passenger Elevator Motors in Pent House
200 A 3 P
30 A 3 P
M
#10-¾"
To 8 ct. Panel in Store #6
To 8 ct. Panel in Store #5
To 8 ct Panel in Store #4
60 A 3 P
#6-1¼"
To 12 ct. Panel in Store #3
To 12 ct Panel in Store #2
To 12 ct Panel in Store #1
Sign Outlets
3-#10-¾"
400 A 3 P Sealed
400 M C.M. -3"
To 12 ct Panel 6th Floor
To 12 ct. Panel 5th Floor
To 12 ct. Panel 4th Floor
To 12 ct. Panel 3rd Floor
To 12 ct Panel 2nd Floor
#12-¾"
To 4 ct. Panel Basement
200 A 3 P Sealed
30 A 3 P Sealed
To 8 ct. Emergency Panel 2nd Floor

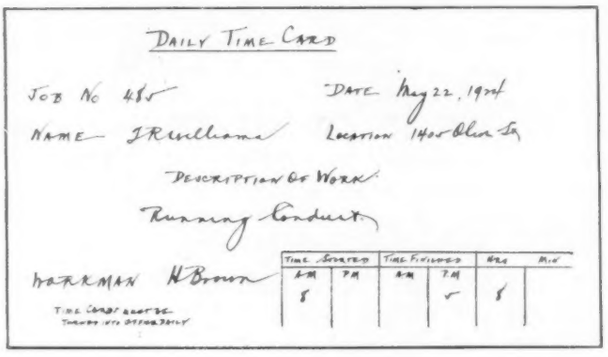
Fig. 12

A Practical System of Accounting for Contractor and Dealer

By F. V. Mitchell

IN the July 15 issue of the Journal of Electricity an illustration of the detailed job cost sheet was presented and it is now the intention to outline the exact method of procedure in the preparation of this analytical form.

The descriptive data at the top of the sheet, such as Nature of Work to Be Done, Date, Job No.,


DAILY TIME CARD

JOB No 485 DATE May 22, 1924

NAME J Reilliams LOCATION 1400 Olive St

DESCRIPTION OF WORK

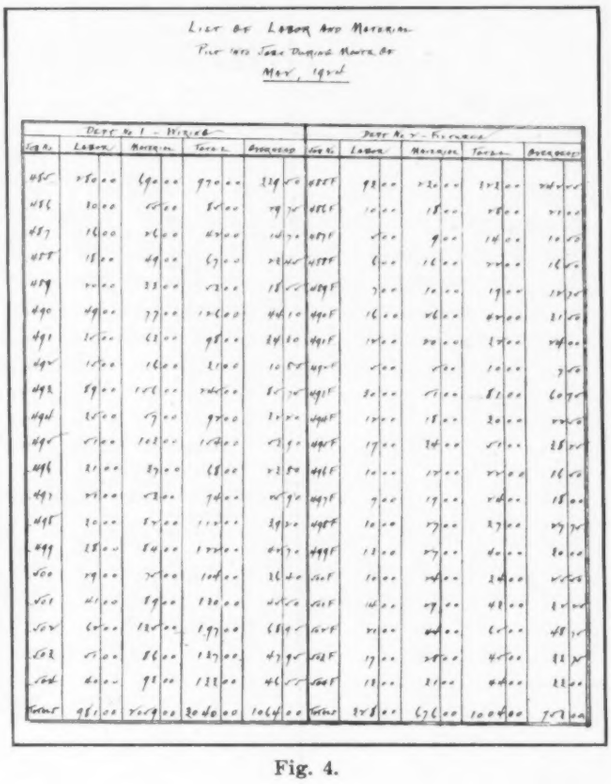
Running Conduit

WORKMAN H Brown

TIME STARTED		TIME FINISHED		HRS	MIN
A.M.	P.M.	A.M.	P.M.		
8			✓	8	

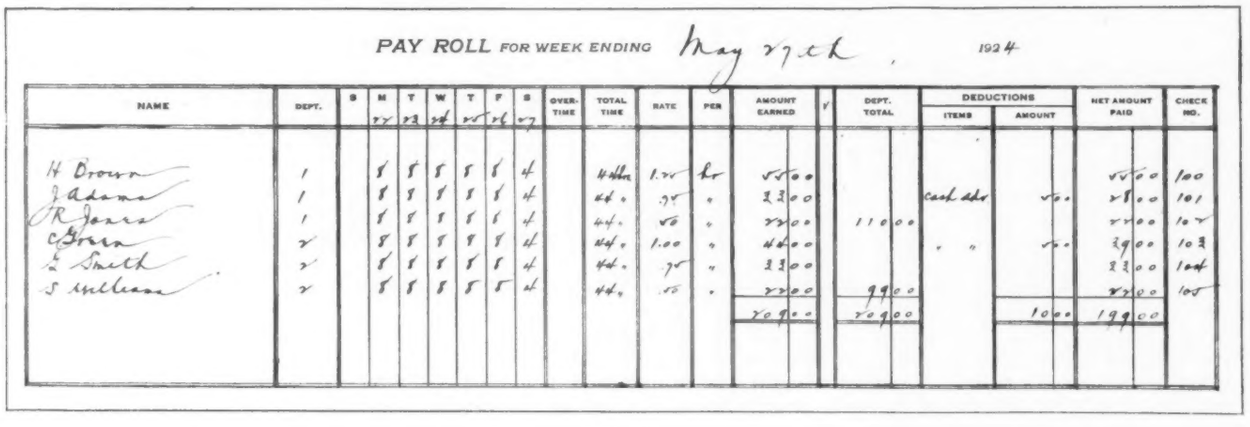
Fig. 1.

Location of Job, Owner, Builder, etc., are obtained from the information contained in the usual form of contract, which is filed in a proper folder provided for that purpose and given the next job number in the order following. The workman's name and number of hours worked are filled in from Daily Time Cards (Fig. 1) turned in by the workmen. The number of hours worked are also entered from the Daily Time Cards opposite the proper workman's name on the Weekly Pay Roll Record, as shown in Fig. 2. The amount of materials used is entered from Material Requisitions (Fig. 3) prepared by the estimator at the time of delivery to the job. A similar form marked "Credit" is used by the stock clerk to list materials returned from the job, which are entered on the Job Cost Sheet as a deduction from the materials sent to the job, the difference representing the net amount of material used to complete the job.


LIST OF LABOR AND MATERIAL
FOR WEEK TAKE DURING MONTH OF
MAY, 1924

DEPT. No 1 - WIRES					DEPT. No 2 - FIXTURES				
JOB NO.	LABOR	MATERIAL	TOTAL	OVERHEAD	JOB NO.	LABOR	MATERIAL	TOTAL	OVERHEAD
485	250 00	690 00	940 00	234 50	485F	98 00	220 00	318 00	79 50
486	80 00	170 00	250 00	62 50	486F	10 00	15 00	25 00	6 25
487	160 00	260 00	420 00	105 00	487F	7 00	9 00	16 00	4 00
488	150 00	490 00	640 00	160 00	488F	6 00	16 00	22 00	5 50
489	70 00	330 00	400 00	100 00	489F	9 00	10 00	19 00	4 75
490	490 00	770 00	1260 00	315 00	490F	16 00	26 00	42 00	10 50
491	20 00	62 00	82 00	20 50	491F	10 00	20 00	30 00	7 50
492	150 00	160 00	310 00	77 50	492F	7 00	7 00	14 00	3 50
493	590 00	1120 00	1710 00	427 50	493F	30 00	70 00	100 00	25 00
494	250 00	470 00	720 00	180 00	494F	10 00	15 00	25 00	6 25
495	710 00	1020 00	1730 00	432 50	495F	17 00	34 00	51 00	12 75
496	210 00	370 00	580 00	145 00	496F	10 00	17 00	27 00	6 75
497	110 00	130 00	240 00	60 00	497F	7 00	17 00	24 00	6 00
498	200 00	510 00	1110 00	277 50	498F	10 00	27 00	37 00	9 25
499	280 00	840 00	1120 00	280 00	499F	13 00	27 00	40 00	10 00
500	190 00	310 00	500 00	125 00	500F	10 00	14 00	24 00	6 00
501	410 00	590 00	1000 00	250 00	501F	10 00	30 00	40 00	10 00
502	620 00	1240 00	1860 00	465 00	502F	11 00	30 00	41 00	10 25
503	510 00	860 00	1370 00	342 50	503F	17 00	28 00	45 00	11 25
504	420 00	980 00	1400 00	350 00	504F	18 00	31 00	49 00	12 25
TOTAL	9810 00	20190 00	30000 00	7500 00	TOTAL	378 00	676 00	1054 00	263 50

Fig. 4.


PAY ROLL FOR WEEK ENDING May 17th, 1924

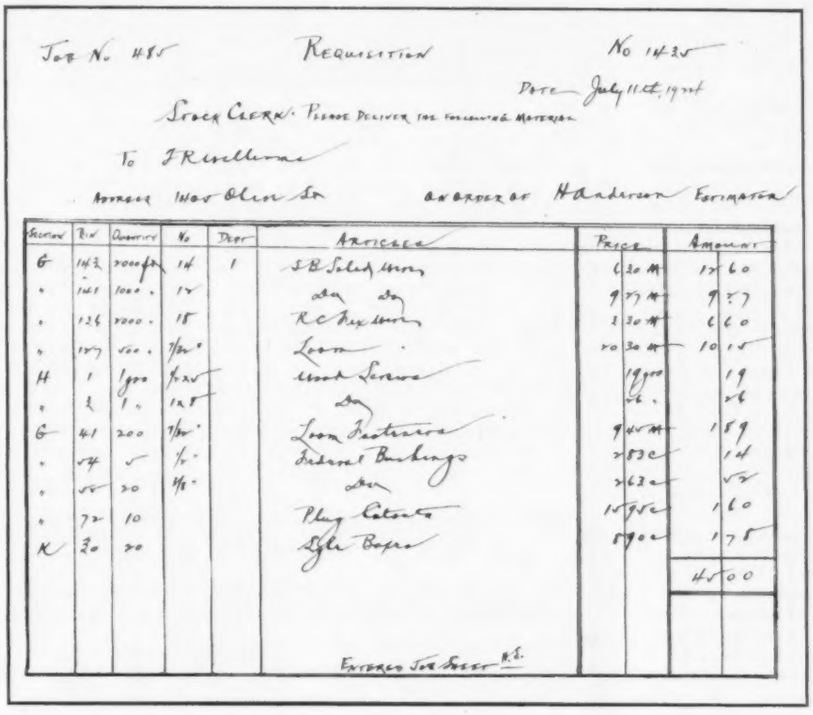
NAME	DEPT.	S	M	T	W	T	F	S	OVER-TIME	TOTAL TIME	RATE	PER	AMOUNT EARNED	✓	DEPT. TOTAL	DEDUCTIONS ITEMS	DEDUCTIONS AMOUNT	NET AMOUNT PAID	CHECK NO.
			17	13	14	15	16	17											
H Brown	1		8	8	8	8	8	4		44 hrs	1.25	hr	55 00					55 00	100
J Adams	1		8	8	8	8	8	4		44 "	.75	"	33 00			Cash Adv	5 00	28 00	101
R Jones	1		8	8	8	8	8	4		44 "	.50	"	22 00		110 00			22 00	102
C Brown	2		8	8	8	8	8	4		44 "	1.00	"	44 00			" "	5 00	39 00	103
L Smith	2		8	8	8	8	8	4		44 "	.75	"	33 00					33 00	104
S Williams	2		8	8	8	8	8	4		44 "	.50	"	22 00		99 00			22 00	105
													209 00		209 00		10 00	199 00	

Fig. 2.

The Job Cost Sheets are filed numerically in a canvas-covered binder provided for that purpose and

at the end of each month the total amount of labor and material put into each job during the month as shown on the job cost sheets is entered on the List of Labor and Material put into jobs during the month (Fig. 4). Through a monthly journal entry the total of the material column is debited to Work in Process account, No. 15, and credited to Merchandise account No. 10, and the total of the Labor column is debited to Work in Process account No. 15 and credited to Accrued Pay Roll account No. 32.

charged to each department is ascertained by the preparation of a summary of the amounts allocated to Wiring (1), Fixtures (2), and Store (3) on the various Expense accounts No. 60 to 73 inclusive, in the General Ledger. The totals of Departments Nos. 1 and 2 should be debited to Work in Process account No. 15, the total of Department No. 3 debited to Cost of Goods Sold (Overhead) account No. 52-C, and the grand total of all three departments credited to Overhead Expense Clearing account



Job No. 485 Requisition No 1425

Date July 11th 1924

Stock Clerk: Please deliver the following Materials

To J Rieselmann

Address West Allis Sta as order of H Anderson Foreman

Section	Bin	Quantity	No	Dept	Articles	Price	Amount
G	143	2000 ft	14	1	S.B. Solid Wire	6 20 M	12 60
"	141	1000 "	12		do do	9 57 M	9 57
"	126	2000 "	15		R.C. Rex Wire	3 30 M	6 60
"	127	500 "	7/20"		Loom	20 30 M	10 15
H	1	1/200	5/25		Wood Screws	19 00	19
"	2	1 "	1x5		do	26 "	26
G	41	200	7/20"		Loom Fastenings	9 45 M	1 89
"	54	"	1/0"		Insert Bushings	2 85 C	14
"	55	20	4/0"		do	2 62 C	52
"	72	10			Plug Cutouts	15 95 C	1 60
K	30	20			Light Boxes	5 90 C	1 18
							45 00

Entered Job Book N.S.

Fig. 3.

As Accrued Pay Roll account No. 32 is debited with the amount of checks drawn and paid for labor during the month, the credit balance of this account represents the amount of labor earned but not paid at the end of each month. This amount should always equal the total of the previous month's pay roll included in the first weekly pay roll checks of the following month. It is very essential that this be verified each month as it proves that all labor paid is being charged properly against the job. It is important that this be done accurately on contract jobs for cost statistical purposes, for if any labor is omitted from time and material jobs it simply means that labor is being paid, for which no returns are received.

The total overhead expense for the month

group 60 to 73. This in effect closes out the Overhead Expense accounts monthly and they are not taken into consideration in the General Ledger Trial Balance. The totals of overhead expense charged to Departments Nos. 1 and 2 for the month, are then divided by the totals of labor and material put into jobs during the month in each respective department, the average percentage obtained in Fig. 4 being 35 per cent for Department No. 1 and 75 per cent for Department No. 2. The total of labor and material put into each job is then multiplied by this common percentage and the amount of overhead on each job for that month is extended in the overhead column, the total of which should agree with the total overhead expense charged against the two departments for the month.

Some Reasons Why Main Fuses Should Be Sealed

High Conductor Capacity and Scientific Fuse Protection Are Often Rendered Ineffective by Fuse Tampering

By BENJAMIN W. CLARK

Chief Inspector, Department of Electrical Inspection, Detroit, Mich.

What the safety valve is to a steam boiler, the fuse is to an electrical circuit. When a boiler is overloaded, the safety valve lets go or else the boiler lets go. When an electric circuit is overloaded the fuse blows out—and if there is no fuse, serious consequences may follow. Is it not strange that the electrical industry, the Underwriters' Laboratories and municipal inspection departments, having gone to so much trouble and expense to make the use of electricity safe, are in so many cases willing to let their efforts go for nothing by permitting users to tamper with the safety valve of the installation—the fuse.

Rarely do people monkey with the safety valve on a boiler, or overload it with weights, yet it is an everyday occurrence for them to tamper with fuses.

An electrical inspector a few years ago visited a neighborhood motion picture theater on one of his regular inspection trips. Overhead sat several hundred persons watching the picture. Below, in the complete wiring of the entire building, he found scarcely a fuse that was not backed by a coin. In all, he took from that installation forty-one cents in money—pennies, dimes and nickels. Fuses had been so fixed that they would carry more load than the line itself, and an overloaded circuit beyond question would have produced a fire, and beyond reasonable doubt a panic.

Why all this fuss about using a certain size of conductor, covered by a certain thickness of rubber? Why require porcelain knobs and tubes, or iron conduits to carry the conductors? Why the expense of testing electrical devices in the Underwriters' Laboratories? Why the trouble and expenditure of inspecting the finished installation? Of what use is a certificate of inspection when five minutes after it is issued the user may, wilfully or ignorantly, make all of these precautions worthless by doctoring the fuses? Such offenses do not come under the criminal code in the ordinary sense. To tamper with a fuse is punishable, it is true, as a violation of the electrical code, but the practice cannot be reached through that channel. In flagrant cases fines have been imposed—even jail sentences been given—but this is not the way to prevent the common doctoring of fuses by people who simply wish to avoid the trouble and expense of replacing them when they are blown out.

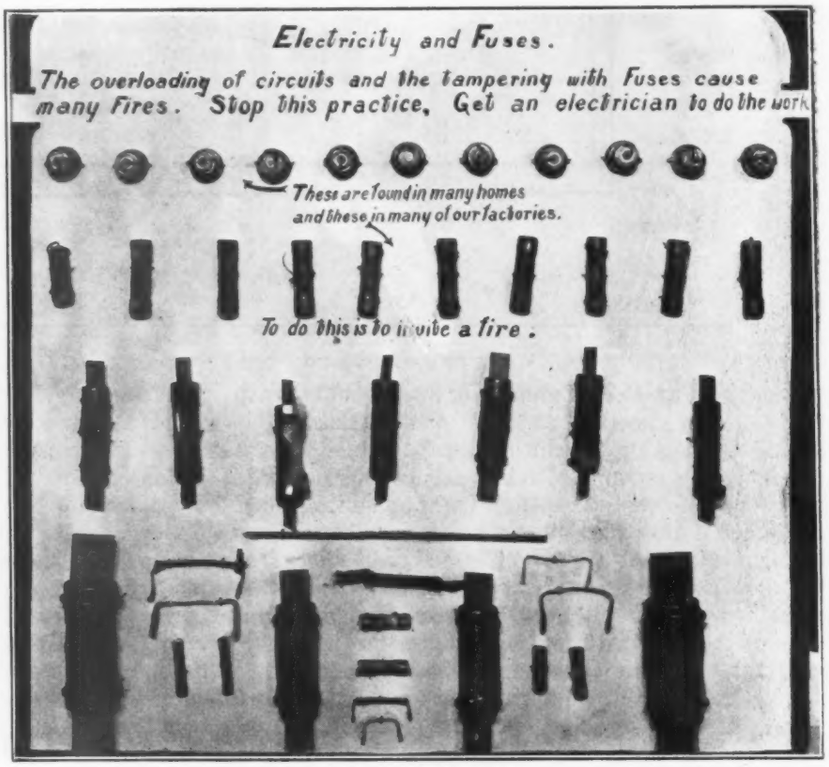
The extent to which fuses are tampered with, in both household and commercial installations, is amazing. The trouble to which janitors and engineers will go to short-circuit a line through a fuse, simply to avoid the trouble of replacing it, is surprising. In a Detroit hotel recently there were found twenty-two brass fuses that had been bypassed by cutting away part of the base and turning it over, thus short-circuiting the fuse. In another part of the same installation were found three pieces of No. 8 copper wire that had been used to replace blown fuses. The inspector in this case just happened to drop into the hotel. Picture what the result might have been if these lines had become overloaded and a fire had resulted in the middle of the night in the hotel, which, by the way, was of wood and a veritable fire trap.

Here is not only a fire hazard but a life hazard that at present can be avoided only by finding out and correcting such conditions. It is not to be expected that people can be fully educated to the dangers of this practice nor can it be expected that ordinances can be universally passed which will prevent tampering with fuses because of the penalty involved. There is only one answer—to seal effectively the main fuses in every electrical installation.

It is very difficult to say just what percentage of fires are caused by such tampering with fuses. The reason is obvious—the fire destroys the evidence. From the number of such cases that are found, however, and from the danger of fire that such a condition produces, it is certain that a great deal of property damage is resulting every day from this cause. Fires that start from electrical defects are mainly attributable to two conditions—either the looping or kinking of wire, or the doctoring of fuses. Several years ago the writer sat in a hall over a big furniture store in a wooden business block. The manager sat at his desk and pointed to the wire of his electric light which was looped and coiled all over the place. He remarked that he had heard that this was dangerous and hight cause a fire. He asked if this were true. Just as he had been told that it was, the wire strangely enough started to smoulder and burst into flames—an unusual coincidence, but a dramatic one, and one that emphasizes the danger of careless wiring and imperfect fuse protection.

Fuses are placed in a circuit for a very good reason—to guard against overloading the conductors, and against short-circuits. When fuses of the proper size continually blow out it is not the fuse that is wrong. When this happens an investigation by a competent electrician should be made. To permit the user to replace these blown fuses with copper bars, wire, nails or pennies is to permit the creation of a serious life and fire hazard. There is no question about the danger of this practice. Every day inspectors from inspection departments and from the fire marshals' offices turn up such installations, and a guess could not be ventured as to how many serious fires have been averted by such discoveries.

In a restaurant in Detroit there was not a single fuse in the installation. In place of the main fuses they had used copper tubing, flattened at the ends to fit the fuse jaws of the switch. This copper tubing has many times the carrying capacity of the conductors. Every branch fuse had been doctored as shown in the illustration. Needless to say, every circuit was overloaded. A report from the fire marshal's office on a large garage shows the same condition existing. Every circuit is over-


Electricity and Fuses.
The overloading of circuits and the tampering with fuses cause many Fires. Stop this practice, Get an electrician to do the work
These are found in many homes and these in many of our factories.
To do this is to invite a fire.

Some examples of coppered and otherwise bypassed fuses found by the electrical inspection department of Detroit, Mich. Many of these fuses had been so wired that they had a greater capacity than the conductors they were supposed to protect.

A collection of fuses, many of which were found in hotels, restaurants and garages, and all of which have been blown and later rewired with non-fusible elements. Particularly interesting is the large piece of copper tubing bent to fuse form and taken from a restaurant.

loaded and every fuse doctored. One instance after another could be cited in which similar conditions have been found, but everyone who has had anything to do with electrical inspection departments has had plenty of personal experience of this nature.

What can be done about it? Is it necessary to stand by and let such an evil go on? Do we have to go along, cheerfully replacing doctored fuses as we find them, and trusting to Providence that those we do not find will cause no trouble?

There is but one solution to the problem—**put the main fuses under seal.** We would not think of permitting a user of electricity to wire his building with bare wire. We certainly would object to his using No. 18 or No. 20 wire in his main and branch circuits. Why, then, let him create almost the same hazard by making it so easy to doctor the main fuses? The plain answer, and the only way out, is to put the main fuses where the user cannot reach them, for if he can he will doctor them, in a large percentage of cases, as soon as they blow out. It is almost unbelievable that, with a full knowledge of the importance of proper fuse protection, so many inspection departments which have given a good deal of attention to the protection of open switches have yet taken no step to eliminate this doctored fuse hazard.

Attractive Fan Window Produces Excellent Results

A seasonable window display of the Electrical Supply Company, Sacramento, Calif., productive of fan sales, is shown in the accompanying picture. The trim, which was supplied by the Westinghouse Electric & Manufacturing Company, features Westinghouse fans, and the material was arranged by F. A. Sieke. The opposite arms of the traffic signal read "Keep Cool," and this signal was revolved by means of a fan blowing on the arms. C. V. Schneider, manager of the company, voiced his approval of the window, stating that the thirty-five fans sold during the two weeks of the display proved its effectiveness. This was considered an excellent showing, considering the fact that the fan season is yet early, and that the weather was cool for a portion of the time.

Alameda County Association Has Monthly Dinner Meeting

The regular monthly meeting of the Electrical Contractors' and Dealers' Association of Alameda County was held at the Newport Cafe, Oakland, Calif., on July 8. The meeting was well attended by members and guests from all over the county.

The dinner, preceding the business meeting, was at six-thirty. Following dinner Mr. Chilcote, as presiding officer, called on several of the guests for brief addresses. Ben Hill, of the electrical inspection department of the city of Oakland, told in brief of the new ordinance just passed in that city and of its benefits to owners of buildings as well as to electrical contractors. Walter Aden, Oakland manager for Fobes Supply Company, San Francisco, spoke briefly on the folly of the low bid and on the necessity for charging a price for work sufficient to yield a legitimate profit. Lloyd Hanlon, of Electric Supply Company, Oakland, spoke on improving conditions and "Tommie" Thompson of the Western Electric Company, San Francisco, told of his company's interest in dealers' associations. L. E. Crandall, of the California Electrical Cooperative Campaign, gave a brief resumé of the June Bride Week campaign and F. V. Mitchell, accountant, spoke on the fundamentals of accounting, giving some questions and answers that had come up in the course of his contact with contractor-dealers.

J. W. Wrenn, range sales manager of the Great Western Power Company, San Francisco, spoke on the merchandise sales policies of central stations and also on the electrification of the home. Mr. Wrenn was followed by Horace Davis, editor of The Home, Electra, Fruit and Garden, who told of the interest of his publication in matters electrical. A. D. ("Dent") Slaughter, manager of Allied Industries, Inc., San Francisco, was the principal speaker of the evening.

Accounting Problem Questions Answered by Expert

The Journal of Electricity has made arrangements with F. V. Mitchell, public accountant of San Francisco, to answer, in these columns, such questions as may be asked on accounting. All readers are invited to forward their inquiries to The Editors, Journal of Electricity. The answers will be published as soon as possible following the receipt of the inquiry.

Question:

Can electrical fixtures be sold at less than double the material and labor costs, and result in a net profit to the contractor-dealer?

Answer:

Electrical fixtures can hardly be sold profitably at less than double the material and labor costs hung up on the customer's wall, when it is taken into consideration that the overhead of fixture departments runs as high as 75 per cent to the material and labor costs.

Fan display of the Electrical Supply Company

JOBBER, DEALER AND SALES AGENT

Getting Better Displays in the District Offices

Pacific Power & Light Company Directs Advertising and Window Dressing Activities from Central Office

Decorating show windows by mail is an innovation that the sales department of the Pacific Power & Light Company of Portland, Ore., has put into effect and has been conducting for over a year. The original trial of the idea brought forth such satisfactory results that no thought has been given to abandoning the policy.

The Pacific Power & Light Company, in common with other central stations engaged in the merchandising of electrical appliances, found that a concentration on one sales campaign was the most satisfactory means of developing sales. For this reason the company was anxious to have each of its district offices feature the same appliances simultaneously in order that a unified appeal might be made to the public. In addition to increasing the sales of the appliances, it was determined that the unit cost per sale was reduced where a larger number of outlets could make use of the same advertising and general merchandising methods.

In regard to developing normal business, it was the opinion of the merchandising department of the company, that more attractive window displays, in each of the district offices, would add considerably to the volume of business that each office would conduct. The problem that confronted the company was how to make these window displays of the most attractive nature and at the same time hold down the expense. The aim was to present displays equal to those designed by expert window dressers at a cost that would be consistent with the returns that could be secured. The company was also anxious to present advertising material that would tie in with the window displays of the various district stores.

Investigation showed that the most advantageous way to handle the advertising would be to have one central office prepare all of the copy for the various districts, the copy to be sent to the district managers for insertion in the local newspapers. It was immediately seen that if all of the districts were to secure their advertising from the Portland office, it would not be advisable to leave the district managers with the problem of preparing their own individual window displays to tie in with the newspaper advertising. One of two solutions remained for the merchandising department—either an expert window dresser would have to be employed to dress all of the windows or some scheme would have to be devised whereby the trimming of the windows could be directed from the head office.

V. H. Moon, appliance sales superintendent of the Pacific Power & Light Company, rejected the idea of having one or more window decorators trim the windows of the district offices, on the ground that the plan was neither practical nor economical. Mr. Moon also decided that the best results could not be secured by counting on the individual office forces to decorate their own windows without advice from the head office.

Some plan, by which the decorating of the district office display windows could be directed from the head office, was necessary and a number of propositions were taken under consideration. In the end a plan presented by Mr. Moon was accepted and put into practice. The plan that was adopted provided in general that suitable window trims should be made up in the Portland office of the company and then pictures of these windows should be sent to the district offices in the towns that the Pacific Power & Light Company serves.

The new plan called for standardized window trims in all of the district windows, the model display to be made up in the Portland office. It was decided that with the assistance of an experienced decorator, attractive window trims could be prepared in the head office, using a standardized set of trimming materials. For this reason it was necessary that all of the trims be simple in their nature. Before the plan was put into effect each district office was supplied with a sufficient quantity of velour, window fixtures, and decorative material to adequately form a background for any display that might be placed in the window. As nearly every one of the stores had a display window of different size, the amount of material sent to each was determined by the window area.

Soon after the district offices had been supplied with the material for decorating their windows, the first standardized window trim was prepared. Because of the varying size of the display windows, it was necessary to consider them as three general types of windows and to fit the trims into these three types. A dummy window, which could be made to correspond to the three types that were to be considered as representing the average sizes of the district windows, was set up in the Portland office of the Pacific Power & Light Company. The advertising program that had been prepared was then consulted and an expert window dresser was employed to decorate the sample window. Using material identical to that sent to the district offices, the trimmer decorated the windows to directly tie in with the advertising that was scheduled for the next week. The display was set up in each of the three type windows and pictures were taken of each display.

Following the actual decorating of the window, the decorator prepared written instructions to be sent along with the photographs and cards used in the display. A full set of cards was prepared for each district office and these, together with the instructions and the pictures of the trim, were mailed to the outlying offices. To prevent any of the window cards from becoming damaged in transit a special pasteboard carton was devised which could be used many times.

On receipt of the material for dressing the windows, employees in the district offices followed the written instructions and trimmed the window to make it appear the same as the photograph did. As soon as the second standardized display arrived, the first was removed from the window and all cards that accompanied the first display were returned to the Portland office of the company, the second display taking the place of the first.

As the standardized window displays have been designed to tie in with the central station company's advertising for a certain period, it is necessary that the new trim reach the district offices in sufficient time to permit all of them to change displays on the same day.

The fifteen district offices in the cities where the Pacific Power & Light Company furnishes electric service have found the window trimming service to be of considerable help to them and customers of the company have commented on the improved appearance of the display windows. On the whole the plan has worked out well and according to Mr. Moon it is contemplated that it will be followed indefinitely.

The cost of supplying the service to the districts has been brought down to a minimum through the use of manufacturers' cards, cartons and display materials wherever possible. This use of manufacturers' material has also brought additional results because of the tie-in with national advertising campaigns. During the time that the standardized window trimming service has been in use the cost of the service has been found to be less than $10 per month per district. The reason for the low cost per month is also partly attributable to the fact that background material, such as velour, pedestals, benches, vases and flowers, are used over and over again, the variety of the display being made in the arrangement of the component parts.

IN preparing the window displays for its district offices the Pacific Power & Light Company first erects the display in the company's head office in Portland, Ore., then photographs the suggested trim and mails copies of the photographs to the managers of the district offices. The trims are made up in three different sizes in order that the suggestions may be made to fit any of the various shaped windows and only standard tables and other miscellaneous matter are used. All of the displays are changed at the same time and advertisements are used to tie in with the display features.

Washington Utility Sells 406 Ranges in Six Weeks

As a Result of an Intensive Sales Campaign 17 Per Cent of Residential Consumers Are Cooking Electrically

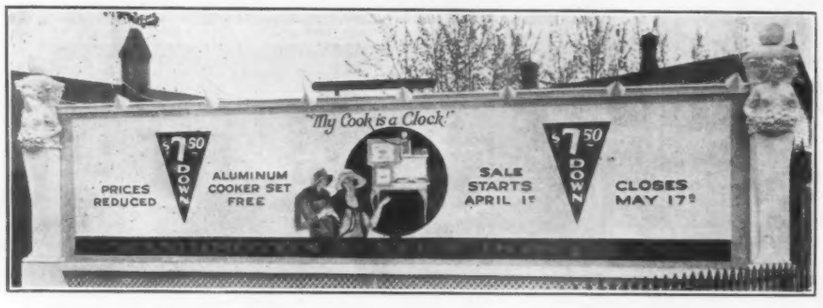
When 11 per cent of the residential consumers in a large city are using electric ranges and water heaters, the question is "How many more can be sold?" This is the problem that confronted The Washington Water Power Company. Last year the company sold 1,048 ranges and water heaters on its system in Spokane and in 53 towns in the Inland Empire. The total number in service was about 5,000 or nearly 15 per cent of all the residential consumers served by the company, and in some of the towns the range users constituted as high as 33 per cent of the number of consumers. Last year out of the total of 1,048 ranges and water heaters actually sold, 75 per cent of the sales was made in two campaigns held during the spring and summer.

Business in Spokane, so far in 1924, has shown some improvement as compared with 1923, but in many of the towns conditions were not so good. In a general way, it seemed reasonable that any campaign held at this time would not be nearly so effective as those held in 1923.

However, a campaign on Westinghouse automatic electric ranges was planned and with only a very small amount of introductory advertising, it was launched on April 1, with the intention of running until May 17. Lewis A. Lewis, sales manager, R. B. McElroy, assistant sales manager, and J. F. Farquhar, general agent, planned the campaign and in so doing they realized that to make the sale effective, ranges must be installed promptly and consequently an ample stock must be available at all times. Experience has shown that the rate of sales per week during a campaign may fluctuate through wide limits, say from 20 to 80 per week and this fluctuation may depend upon delicate changes in local conditions, such as weather, holidays and other matters that affect prospective purchasers. The big question in the Spokane campaign was "How many can be sold?" and the success of the campaign hinged upon the solution, as orders for the proper number had to be placed in advance. The three men made a close estimate and accurately gaged the needs of the public.

The advertising in Spokane was placed with three local newspapers and during the seven weeks of the campaign, 2,151 in. were used with thirty-one insertions. The advertising in the smaller towns was handled by thirty-seven newspapers, with an average of one insertion per week, with sixteen to twenty inches for each insertion. An attractive insert was mailed with every residential bill sent out during the campaign and in Spokane several illuminated signs were installed upon principal car lines, showing the Westinghouse range with the legend "My Cook is a Clock." This sign also pictured the badge of the campaign, a pennant marked "$7.50 Down."

As a special inducement, a four-piece Cloverleaf cooking set was offered free with each range and the price quoted included range, water heater and complete installation. How successful the company was is shown by the fact that 406 ranges and water heaters were sold during the seven weeks. The detailed results showing where the ranges were sold are shown in the accompanying table.



Attractive billboards of this character were used to call attention to the advantages of buying immediately.

	Spokane	Towns Directly Served	Total
Population	115,000	55,000	170,000
Residential consumers	24,700	7,500	32,200
Westinghouse 3-19B ranges	231	111	342
Westinghouse 2-19B ranges	18	17	35
Westinghouse 5-15 ranges		2	2
Other makes	10	17	27
Total sales, new ranges	259	147	406
Gross sales value			$92,862.25
Annual revenue @ $90.00			36,540.00
Total in service	3,207	2,279	5,486
Percentage of residential consumers	13	30.2	17

The actual sales were effected by twenty-five district and local agents of the company and in Spokane by eight regular city salesmen, working in individual territories, and by the organization of the Electric Shop. To encourage these salesmen, Mr. McElroy issued a circular on March 31 which read as follows:

The record made last year during a similar sale places this department squarely up against a goal that can be crossed by 100 per cent team work. This means cooperation among the men on the firing line, in the store and by the company.

You recall there are four parts to a sale:

ATTENTION
INTEREST
DESIRE
POSSESSION

The company has authorized the expenditure of a substantial sum for advertising which will go a long way toward attracting the **ATTENTION** and creating the **INTEREST** of many prospects. Your work will be to so prepare yourself that you will be able to stimulate their **DESIRE** to the point of **POSSESSION**. It's a 50-50 game, boys, so let's play it together and according to rules.

The money spent for advertising is for your benefit—to multiply your prospects; to eliminate sales resistance; to place you above any competition; to increase the proportion of sales to calls and to insure you a welcome by every woman who appreciates the greatest household labor-saver.

Every man has been assigned a man's size job to do and when he performs his duty, the company has authorized us to pay him for the extra time and effort required.

BONUSES AND PRIZES FOR SALESMEN

$50.00 for each salesman who makes quota.

$1.00 per range sold by salesman to be put in a pot and distributed weekly to the three salesmen who sell the most ranges that week. Distribution in the proportion of 3-2-1.

GRAND PRIZE of $30.00 to the salesman who sells the most ranges during the campaign. Second high salesman, $20.00.

Remember that real salesmanship starts when the customer says, "NOT INTERESTED."

Every one of the city salesmen made his quota, J. R. Weideman selling a total of forty ranges and winning first prize for the campaign and Carl Hoffman took second prize with the sale of thirty-five ranges. These two salesmen received also a substantial share of the weekly prizes. In addition to the prizes the salesmen received the usual 10 per cent commission on all range sales.

The Western Electric Company has prepared for distribution a new lighting manual giving information on lighting systems in general and on representative units which will fit into all lighting requirements. The units selected are illustrated and complete information on them, as to sizes available, wattage, distribution of light, and the method of planning and installing them, have been incorporated in the manual.

The Bryant Electric Company, Bridgeport, Conn., has recently redesigned its No. 59,107 outlet box receptacle so that the boss on the back will fit in holes 1-11/16 in. in diameter. The body of the receptacle is white glazed porcelain with shade-holder groove to receive any standard weatherproof or clamp type shade-holder taking 2¼ or 3¼-in. shades. The company has redesigned its No. 699 Spartanette attachment plug. The redesigned plug is such that the cord hole is elongated to take parallel conductor cords used for portable devices. The company's No. 75 Wrinklet keyless socket body has also been redesigned, allowing the use of bigger binding screws. The terminal connected to the screw shell of the socket has been nickel-plated to conform to the system of identified terminals. A new design of appliance switch plug to be known as No. 752 has been put on the market by the company. This plug is designed to fit 3/16-in. round pins spaced ¾ in. on centers.

Selling Goods Over the Counter Without a Counter

Electric Supply House of Everett, Wash., Arranges Store to Get the Most Floor Space for Display Purposes

A store without a counter seems rather unusual largely because past custom has closely tied the counter with any retail establishment. The fact that the Electric Supply House at Everett, Wash., has no counter may be the reason why this concern has attracted considerable attention in the Washington city.

According to an article in a recent issue of The Edison Sales Builder, by Verne D. Harrison, of the Seattle office of the Pacific States Electric Company, "the store is without a counter, and everything is in plain view, within easy reach of the customer. In fact, it is the personal service that is the big factor in making a success for Mr. Erickson, the proprietor."

The Electric Supply House has arranged its show room with the idea that the average customer desires to see a variety of articles of the same general class before any purchase is made. To enable the customer to make a selection without causing a great amount of inconvenience for either buyer or salesman, counters have not been placed in the store. By eliminating the usual counter the company has made it possible for customers to go directly to any portion of the store to look at any class of merchandise and get within easy reach of any particular article. After getting so close the customer can view the merchandise without taking it from the shelf, thus eliminating in many cases the lost time involved in bringing numerous samples to the counter in the front of the store.

The experience of the Electric Supply House has been much the same as that of other stores that have eliminated the counter from the store fixtures. By doing away with the counter it has been found that the store is given an appearance of greater size than it would have if counters were run either across the depth of the store or along the depth. Thus greater floor display space has been obtained without the necessity of cutting down any of the wall display cases, bins or drawers.

The arrangement adopted by the Everett store is particularly adapted to locations that are of considerable depth and of small width. In the forward part of the show room there is a series of showcases fitted against the wall and equipped with sliding glass fronts. In these cases the smaller appliances are displayed and are protected from dust and atmosphere by the glass fronts. To the rear of these cases are rows of shelves set off by evenly spaced partitions in order that goods of a similar character may be kept together. The shelves and showcases are raised from the floor about 2½ ft. and extend to within about the same distance from the ceiling. Below the set of shelves there is a long shelf extending from the front of the store to the rear. This shelf is about 15 in. wide and beneath this are rows of drawers and bins.

On the opposite side of the store are rows of alcoves for the displaying of lighting fixtures of the table and bracket type. Ceiling fixtures are hung down each side of the store and each fixture is controlled by a separate pull switch.

The lamp department is maintained in the rear of the store on the right hand side. In reaching the lamp department the customer must walk the full length of the store and in so doing of course notices the displays of appliances and devices on either side. For demonstrating lamps Mr. Erickson has prepared a rotating display rack that is so designed that when the wheel on which the lamps are fastened is rotated the top lamp is lighted.

The arrangement for the store as designed and put into effect by the Electric Supply House is unique in Everett and has been found to be well suited to the displaying of commercial and industrial merchandise that the company carries.

The Henger Seltzer Company, electrical jobbers, have just opened a branch at 1125 Wall Street, Los Angeles, Calif. The firm will deal in radio and electrical equipment and will cover the entire Pacific Coast.

Standard Wiring Symbols to Be Distributed in Denver.—Copies of the revised standard wiring symbols, approved by the various national electrical organizations, have been secured by the Electrical Cooperative League of Denver, Colo., for distribution to all architects, builders, and members of the electrical industry in its territory. The symbols are printed on cardboard and are suitable for mounting or framing and carry the name of the league.

The F. W. Wakefield Brass Company, Vermilion, Ohio, has adapted a screwless holder to Red Spot hangers for commercial lighting service. The device has been called the "slide-inside" holder, as there are two slides within the holder shell which may be pushed up or down by the operation of a small protruding knob. These holders slide inside the globe, supporting it firmly. For the present this holder is available only with standard Red Spot hangers of the 6-in. size.

A WINNER'S MOTTO: KEEP ON PEDALING

By JOE OSIER

Years ago, when mutton leg sleeves and mutton chop whiskers were in vogue and the—

Bicycle built for two was a keen rig—

A business man I know, who is as welcome at a bank as a hundred thousand dollar account—

Snagged many simoleons and no few medals in bike races which sport, it will be remembered—

Had the well known populace by the w.k. ears in the days long gone.

But the march of progress put the bicycle out of biz—a Detroit manufacturer developed the national nuisance and—

The business man I know vaulted into the seat of a flying flivver and proceeded to accumulate a barrel of doubloons and—

Today he puts the divine spark on checks which go to hundreds, comprising his pay roll.

"Keep on pedaling."

Recently while questing for an inspiration for the preachment, I buttonholed this bold buccaneer and asked him how he scaled the ladder of success. His reply, made to order for magazines featuring "How I Won My Wad" was—

"I kept on pedaling." * * *

"When I was in the bicycle racing game, I soon learned never to quit pedaling. Regardless of how much I was outdistanced; despite tough going and hard luck, I stayed in the race and, usually, crossed the finish line a winner.

"The times I didn't win, I had the satisfaction of knowing that I tried—that I did my best. And, I use the same idea—

"Keep On Pedaling—in my business today.

"When times are good, I pedal; when bad, I pedal all the harder. When volume decreases, when collections are poor, I pedal until I have a comfortable lead, then—

"I keep on pedaling.

"I never give up—never admit defeat. There is my secret. You are welcome to it."

And so I hurried from his office with the idea fixed in my mind and a determination to buy a bicycle and, forthwith, pump up the golden path that leads to—

Meat three times a day.

Business men whose affairs are in the doldrums—who are so hungry they do not know where they are going to sleep—who do not know which way to turn to—

Escape their creditors—

Can do the same as I intend to do—to-wit:

Take this bicycle idea to their bosoms—apply it in their business and—

"Keep on pedaling."

INDUSTRIAL NEWS

California Water Situation Is Analyzed by Commission

Deficient rainfall and run-off throughout California over a succession of seasons has resulted this year in the most serious drought ever experienced since records of stream flow have been taken generally in the state, according to the Hydraulics Division of the California Railroad Commission. In a statement issued July 22, the commission announced that the Sacramento River at Red Bluff on June 30, 1924, showed a discharge of 2,900 sec.-ft. compared with 3,740 sec.-ft. on June 30, 1920. The lowest previous record of discharge at this point for even less than a day period was 3,150 sec.-ft. The gage at Red Bluff is above all diversions, with one exception, on this river and thus accurately shows the situation in this basin. The discharge of the Sacramento River is still decreasing.

Other rivers of the state have been even more seriously affected by the drought. According to the commission's report the Mokelumne River at Clement showed a discharge of 15 sec.-ft. on June 30 of this year, whereas on the same day in 1920 the flow was gaged at 500 sec.-ft. Similar gagings on the San Joaquin River at Newman showed that the flow on the last day of June this year was 100 sec.-ft. as opposed to a flow of 1,960 sec.-ft. on June 30, 1920. In the vicinity of Fresno, in the Kings River Valley, it has been necessary to withhold water from some 400,000 acres of irrigated land due to the low flow in the Kings River.

The situation in the northern part of the state is represented very well by the records of the Pacific Gas and Electric Company and the Great Western Power Company. The former reports that this year the stream flow averaged over the year has been about 66 per cent of normal. For the month of July it was 53 per cent. Storage in the South Yuba, the Mokelumne and the Stanislaus Rivers is 90, 70 and 85 per cent of normal, respectively. These figures show perhaps the most favorable storage situation in the state.

The Great Western Power Company has reported that the stream flow in the Feather River is 40 per cent of normal, the flow registering 660 sec.-ft., whereas the normal flow at this time of year is 1,620 sec.-ft. Storage on the Great Western system is 47 per cent of normal.

The San Joaquin Valley has probably suffered more than any other part of the state. Last year the Kaweah River had a flow of 580 sec.-ft.; now it is carrying 30 sec.-ft. and is rapidly drying up. The Kern River, with a normal July flow of 1,350 sec.-ft., is at present carrying about 120 sec.-ft.

Huntington Lake, typical of the basin from which a large part of southern California's hydroelectric power is derived, in 1919 collected 53,000 acre-ft. which represented the lowest flow on record until 1924. This season only 17,000 acre-ft. flowed into the lake.

Utility May Refuse City Offer for Distributing System

Although no definite answer has been given to the proposition, the Colorado Springs Light, Heat & Power Company will probably refuse the recent offer made by that municipality to purchase the existing distribution system of the company. The city has proposed to buy the system for $750,000.

George P. Riley and G. W. Munson of New York, representing the bondholders, recently conferred with the city council at which time the proposition to buy the distributing system was submitted. The company claims its system is worth double the amount offered and to prove this is desirous of having a revaluation made on the basis of the state public utilities commission valuation of 1916 minus subsequent depreciation.

According to reports from the Mountain region, this deadlock between the city and the company was expected as the next step in the tangle of negotiations resulting, first, from the failure of the company to secure a new franchise last year and, second, owing to the recent authorization of the city at a special election for sufficient bonds to build a new system including a steam generating plant.

It is understood that plans for this steam plant, which will be either 2,500 or 5,000-kw. capacity, are progressing under the direction of Franklin P. Wood, Denver consulting engineer. His firm has also completed plans for an additional hydroelectric plant for the municipal system at Ruxton Park to cost about $50,000.

Gas and steam heating service are not being considered by the city as it is said the municipal plans provide for an electric heating and cooking rate far lower than the rates of the present company.

New Generating Plant to Be Installed at Moving Picture Studio.—To supply the needs for electrical energy of the Universal Pictures Corporation at Universal City, Calif., the company is to install 30,000 kw. of generating equipment there. The generators will be driven by Diesel engines. The current will be distributed over the company's "lot" at two voltages to facilitate the use of various types of illuminating equipment and motor driven apparatus. At present the company is using central station energy.

Federal Permits Are Issued for Klamath River Project

Preliminary permits covering power projects on the Klamath River in northwestern California have been granted to the Electro-Metals Company of San Francisco by the Federal Power Commission. Action on the applications has been delayed on granting the permits because of the fact that the state permit had not been secured. This permit has recently been issued despite the fact that the California Fish and Game Commission opposed such action.

The erection of dams on the Klamath River has been protested by the fish and game commission on the ground that salmon could not cross these obstacles. The permits that have been issued state that a plan for the protection of the salmon must be worked out before construction work may be started.

The Electro-Metals Company contemplates the expenditure of approximately $15,000,000 on the development. The project includes the erection of a generating plant at the confluence of the Klamath and Salmon Rivers where 125,000 hp. is to be developed. It is stated that the company contemplates using the energy in electro-chemical and electric smelting plants in the vicinity of Trinidad on the California coast, north of Eureka.

Final Injunction Is Issued on Diamond Creek Project

The Diamond Creek development on the Colorado River in Mojave County, Arizona, proposed by J. B. Girand, Phoenix engineer, is indefinitely held up as the result of an order issued by United States Judge Jacobs at Prescott, making final the injunction issued by him March 22, 1924. This action was asked by the Federal Power Commission on the basis of its announced intention to allow no development work until an agreement is reached on the Colorado River compact.

Mr. Girand received a permit from the Arizona state water commission in 1923 to proceed with the project and started construction work in December, a week before his permit expired. He was halted by the Federal Power Commission, which received a court order in the form of a temporary injunction. It is possible that if no work is in progress in December of this year, the state permit will be lost. As Arizona is extremely hostile to development of the river's resources by any other agency than the government or itself, it is doubtful if an extension will be granted by the present administration.

Litigation May Be Resorted to in Idaho Rate Case

As the result of an order issued by the Public Utilities Commission of Idaho directing the Idaho Power Company to show cause why its rates for lighting and power service should not be reduced ten per cent and why the minimum charges for water and air heating service should not be substantially reduced, the Idaho Power Company, on July 24, filed a bill of complaint in the United States District Court for southern Idaho naming the public service commissioners and the state attorney-general as defendants. Although the rates fixed by the commission in March of this year apparently brought to a close rate and valuation proceedings extending over a period of four years, it is now evident that the entire case is to be opened to further litigation.

Detailed inventories, looking to a valuation of its properties, were filed by the power company, which serves a large part of southern Idaho, in October, 1920. Hearings were held throughout the year 1921, but not until December, 1922, was the commission's valuation decision entered. Further delays ensued, the rate case proper not being reached until November, 1923. The commission's rate order, issued February, 1924, unified rates throughout the territory served, eliminated discriminations, and, so it was believed, provided schedules which would give the company a return of about 7.3 per cent. Monthly reports filed by the company and checked by the commission engineer and an out-of-the-state expert showed that revenues were not exceeding what the commission had contemplated, but, yielding to what is reported to have been political pressure, a majority of the commission issued the recent "show cause" order.

Commissioner F. C. Graves, in a dissenting opinion, calling attention to alleged inconsistencies in the majority order, urging that the rates fixed in March were the result of mature, unhurried deliberation, closed with the following paragraph: "If this commission (after years of work), is to establish its own set of rates one day (which rates with the exception of water heating have simply made uniform the rates existing previously as shown by the tabulation as herein set forth), and four months and a half later ask the company to show cause why the commission's own rates should not be reduced, without giving the said rates a fair trial, it is my firm conviction that it has forfeited any right to be considered seriously, except as a necessary stopping place on the way to the courts."

Llewellyn Evans, superintendent of the light and power department of the city of Tacoma, Wash., who was called in by the commission to investigate and report on the situation, wrote a report to that body at Boise, July 19, 1924, in which he said: "The files, data sheets, plotted curves, and compilations available showed that infinite care and long study had been applied to make the findings in the recent case accurate, and the accuracy is attested by the results shown in the reports coming in from the Idaho Power Company." He commented on the physical properties of the company to the effect that he found them in excellent condition and well and economically operated. After discussing the water heating rate at some length he said: "As to the proposed ten per cent uniform and general cut on all rates except minimum rates, I have not as yet completed my study, but from a rough comparison with the Tacoma municipal plant I can easily see that the rate payers are not being grossly overcharged."

License Extension Granted for Yuba River Development

The license issued the Excelsior Water & Power Company, Smartville, Calif., on March 24, 1924, has been extended by the Federal Power Commission so that the maximum period is 25 years instead of 10 years. This change was authorized when the company advised the commission that it would be unable to finance the project unless the term were extended.

The license covers a development on the South Fork of the Yuba River in Nevada County, California. The project is not the most effective use which can be made of the resources of that stream. It seems entirely probable, however, that 25 years will elapse before it will be feasible to undertake a more comprehensive project. For that reason the commission extended the period of the license with the understanding that the license will terminate two years after the commission may have issued a license for a more comprehensive project. The licensee, however, is to be given preference in the extension of rights for the development of the entire stream.

Silver Creek Permit Is Granted to City of Sacramento

A preliminary permit has been granted by the Federal Power Commission to the City of Sacramento, Calif., which will permit diverting the upper tributaries of the Rubicon River into Silver Creek, a tributary of the South Fork of the American River. The idea is to develop power in Silver Creek and to carry this water from the mouth of Silver Creek through a conduit to Sacramento for water supply and for irrigation purposes in the vicinity of the city.

The California Power Board recommends that the Rubicon should not be diverted out of its own basin but should be developed in its natural course. The preliminary permit will require the city to make that alternation in its plans.

A protest had been filed with the commission by the Western States Gas & Electric Company. That company claimed that Sacramento's project would injure its project on the South Fork of the American River by reducing the flow of Silver Creek. The city, however, entered into negotiations with the company and the protest was withdrawn.

Oak Grove Plant to Be Opened Aug. 6.—The formal opening of the Oak Grove plant of the Portland Electric Power Company will be celebrated Aug. 6. President Coolidge will press a button on his desk in Washington to start the plant. Guests from the Northwest will be in attendance at the opening of the first unit of the new power house.

Edison Company Puts Additional Steam Plants in Service

The Southern California Edison Company, in an effort to meet the emergency caused by the water shortage in California, has placed in service a total of 26,620 hp. in steam capacity in the form of small or obsolete plants which have been leased from industrials in southern California. In addition one 13,000-hp. turbine has been purchased and installed in record time in the Long Beach steam plant and two 6,500-hp. turbines which were supplied by Eastern manufacturers were placed on the line July 15. Work is progressing rapidly on the Long Beach No. 2 steam plant, which will have a capacity of 93,000 hp., and which will be in operation by Jan. 1, 1925.

The plants which have been leased from industrials and rehabilitated follow:

	Hp.
Pacific Electric Railway—	
Vineyard Substation Plant	4,600
Sixth and Central Plant	13,000
Anaheim Sugar Company	660
Huntington Beach Sugar Company	660
Santa Ana Sugar Company	400
Los Alamitos Sugar Company	660
Monolith Cement Company	1,300
Union Tool Company, Torrence	660
Sugar Pine Lumber Company, Fresno	2,600
Standard Oil Company, Whittier	400
City of Riverside Plant	530
Chino Sugar Company	820
Oxnard Sugar Company	330
Total	26,620

Neither of two plants which have been leased from the Pacific Electric company have been in operation for ten years.

In addition energy is being purchased from the following sources:

	Hp.
Los Angeles Gas & Electric Corporation	33,000
City of Pasadena	13,000
San Diego Consolidated Gas & Electric Company	5,300
Total	51,300

A contract has been made with the San Joaquin Light & Power Corporation, Fresno, to deliver 16,500 hp. commencing Aug. 1.

Initiative Measure to Prevent Dams on Klamath Filed

One hundred and thirty thousand signatures to an initiative measure which would prevent the construction of power dams or any other artificial obstruction in the Klamath River in California have been filed with the Secretary of State at Sacramento, Calif. The Act, known as "a measure creating the Klamath River fish and game district," is sponsored by the salmon interests, sportsmen and the California Fish and Game Commission. It prohibits the construction or maintenance of any dam on the river below its confluence with the Shasta River in Siskiyou County and provides for several penalties should its provisions be violated.

The filing of the initiative petition has particular bearing at the present time in view of the fact that the Federal Power Commission has just issued preliminary permits to the Electro Metals Corporation of San Francisco for a development on the river. This company plans to expend $15,000,000 for the construction of a 125,000-hp. plant at the junction of the Klamath and Salmon Rivers.

West Receives Attention at World Power Conference

Representatives of Thirty-five Countries Discuss Problems of Electrical Industry in All Parts of World

By ROBERT SIBLEY

Special Correspondence

Today, July 12, the first World Power Conference is closing its sessions at London and those of us who have taken part in its discussions realize that a number of things have transpired in its deliberations to make it stand out as a new mile post in international endeavor.

The five thousand pages of reading matter contributed in papers before the convention covering, in complete detail, the present status of world power development in all its ramifications, in themselves constitute an achievement worth the effort involved in bringing the great conference to life.

But I think that even more important than this are the contacts that have been established among the thirty-five different countries represented in attendance that will enable our industry in the future to better take advantage of present world knowledge for future progress, and at the same time better to co-ordinate effort in economic power development.

The conference was called by a group of British manufacturers largely to gather at the British Empire Exposition, which is a notable undertaking in itself, a representative group of men from the nations of the world to see the steps that the British Empire is making in industry, in engineering and in the arts. It has far exceeded expectations.

Listed among those in attendance at the Power Conference were the greatest and most noted names in present day engineering achievement from every part of the globe.

Three things have developed at the conference that are of unusual interest to men of the electrical industry in the West. First, the West has come in for its share of attention throughout the discussions as a leader in long distance high voltage transmission with its economic network of distribution lines. In the second place, the increasing attention that is being given in the West to uses of electricity in agriculture has been followed with marked interest; and in the third place, the pronouncement by no less an authority than Arthur T. Hadley, president emeritus of Yale University, before the sessions that the electrical industry as a progressive and still experimental industry needs the nurture and attention of private initiative to bring it to its full economic evolution, created a profound impression.

Dr. A. E. Kennelly at one of the banquets ably sounded the keynote of the convention when he said that the new understanding among people and nations is more and more coming to be that title to property is not absolute but is accompanied by a trusteeship of the owner that bears with it the obligation to better society generally in the uses to which property is put.

The conference came to a close by passing unanimously the following declaration: "That this conference is of the opinion that the world's most crying need today is greater production and manufacturing activity among its peoples under conditions which will promote individual prosperity and happiness, and that this can be largely achieved by the fuller development of national power resources and by the establishment of the most economical means for the general distribution and utilization of energy."

Large Synchronous Condenser Is Ordered for Vaca-Dixon

The Westinghouse Electric & Manufacturing Company, through its San Francisco office, has received an order from the Pacific Gas and Electric Company for a 40,000-kva. synchronous condenser to be placed in the Vaca-Dixon substation. The machine will be the largest of its type ever constructed and will be used for voltage regulations on the 220-kv. line from Pit No. 3 power house. It will supplement two 20,000-kva. machines which are now in operation at the substation.

A 1,800-hp. motor will be direct connected to the condenser to permit its operation as a generator for line testing purposes. This is the first time that a synchronous condenser has been planned for this kind of special service. The condenser unit will be approximately 20 ft. long, 14 ft. 8 in. high, and will weigh 180 tons. The machine with its immediate auxiliaries represents an investment by the Pacific Gas and Electric Company of approximately a quarter of a million dollars.

During the last three years approximately 400,000 kva. in synchronous condenser capacity has been sold to central stations in California. It is estimated that 85 per cent of this equipment has been Westinghouse.

Fire Damages Southern California Edison Steam Plant

Fire at the 53,000-hp. Redondo steam plant of the Southern California Edison Company at Redondo Beach, Calif., July 15, was caused by the failure of an oil switch to clear a dead short on one of the 15,000-volt lines one mile from the plant. The switch exploded and caused a hot oil fire which lasted for three hours. Foamite was finally used to extinguish the flames.

One section of the south 15-kv. bus was damaged as were the leads to other switches and instrument transformers. A large hole was burned in the south side of the building and the adjacent roof. The fire was confined to one switch gallery. A duplicate gallery was unharmed, permitting the resumption of full plant operation in five and one-half hours after the trouble occurred.

The damage is estimated at only $3,000. The fire started at 1:30 a.m. According to H. G. Butler, power supervisor, the system loss was 160,000 kw-hr., an appreciable amount in view of the acute power shortage.

Engineering Foundation Publishes Year Report.—A report containing a record of the activities of the Engineering Foundation for the year ended Feb. 14, 1924, has recently been published.

Baker River Permit Issued to Washington Utility

A permit authorizing the Puget Sound Power & Light Company to begin work on its Eden power site on the Baker River in Skagit County, Wash., has been issued by Marvin Chase, state supervisor of hydraulics. The development involves the construction of a hydroelectric plant with an ultimate estimated capacity of 45,000 hp. at a cost of about $3,500,000, and the formation of a reservoir capable of impounding 50,000 acre-ft. of water at an estimated cost of $1,500,000.

The company will be permitted to appropriate 4,000 sec.-ft. of water from the river. The diversion dam will be 235 ft. high, 325 ft. wide on top and 100 ft. wide on the bottom. The reservoir will flood 1,600 acres, the maximum depth being 200 ft. and the approximate mean depth 31 ft. The dam, power house and other improvements will be of concrete.

Three Substations to Be Built by Portland Company

The Northwestern Electric Company of Portland, Ore., is planning to erect three new substation units for regulation and distribution of current through the city. The three sites are at East 30th Street just south of Hawthorne Avenue, at 17th and Madison Streets, and on 17th Street between Pettygrove and Overton Streets. Equipment will be installed at these places for semi-automatic control of voltage through the adjacent districts. In the past the Northwestern Electric Company has maintained street transformers in these districts. The substation sites will be surrounded with shrubbery and will be made as attractive as possible.

Each substation will have a capacity of 3,000 kw. and the semi-automatic features will make the attendance of an operator unnecessary. This new apparatus will be ready for service about Oct. 1, and will cost approximately $130,000.

Finance Corporation Opens Coast Offices in San Francisco

The Household Utilities Finance Corporation, of Chicago, Ill., has recently opened Pacific Coast offices at 322 Rialto Building, San Francisco, Calif. Tracy W. Simpson, formerly western district manager of the Federal Electric Company, has been appointed Pacific Coast manager of the company which specializes in the purchasing of dealers' installment contract balances on articles sold for the home. The company also has a special plan of financing the contracts of ranchers and other agricultural buyers who do not have regular monthly incomes and are therefore not susceptible to being sold on the monthly payment basis.

This company is said to be the largest in the United States operating exclusively outside the field of automotive financing.

Relation of Electricity to Mining to Be Considered at Convention.—At the annual convention of the American Mining Congress, to be held at Sacramento, Calif., Sept. 29 to Oct. 4, the greater utilization of electric power in mining will be considered. One entire session will be devoted to this discussion.

New Home Occupied by San Diego Public Utility Company

Finding that the growth of San Diego, Calif., was putting a serious strain upon its office facilities, the San Diego Consolidated Gas & Electric Company in 1923 purchased the Timken Building at the corner of 6th and E Streets in San Diego. After the former tenants had vacated and the necessary changes were made, the doors of the new commercial offices of the San Diego Consolidated Gas & Electric Company and the ground floor of the renamed Electric Building were opened to the public June 16, 1924. Several views of the new offices are presented on page 82 of this issue.

For three years prior to the purchase of the building, the executive and engineering offices of the company had been located in the Timken Building, a whole floor having been rented for the purpose. Upon the acquisition of the building, the eighth floor was immediately remodeled and the executive offices of the company moved to that location. Extensive improvements on the second and third floors were also begun. The removal of two of the elevators, and their replacement by high speed safety elevators, was also started.

Work on remodeling of the ground floor for the new commercial offices was not begun, however, until the first of this year, because of leases held by previous tenants of the quarters. Under the direction of H. R. Peckham, assistant general superintendent, the new offices were speedily put in shape.

The change recently made by the company places the commercial, collection, investigation, and securities departments in the south half of the main floor. The north half is occupied by a bank.

The color scheme employed, as well as the entire decorative effect, has been toward a dignified simplicity and warmth. Upon entering the lobby, the customer sees a room lighted by a softly colored, concealed light. The floor is of light gray linoleum, inlaid with black. The counters and fixtures are fronted with Houteville marble of a cream-tan color, in which a delicate niching has been chiseled. The baseboards are of black Belgian marble and the woodwork of a brown mahogany. Mahogany furniture is used throughout to conform with the general color scheme. Directional notices are contrived from partitions of plate glass, in which the lettering is etched and lighted by concealed lamps underneath the base, which throw invisible rays of light up against the etching in the glass.

In equipment, the offices have been given the benefit of the most up-to-date machinery. An extensive intercommunicating dictagraph phone system, as well as a telephone system from the central switchboard, places every department in close contact with the other. The information girl at the entrance has a substation dictagraph from which she can reach all departments in the building.

Pneumatic tube systems connect the order, investigation, collection and new business departments with the billing, meter readers and records departments of the company. The telephones at the counters are provided with a special niche on the inside of the counter, concealed from public view and yet handy for those who may wish to use them. A "kick" space underneath the counters makes it easy for the attendant to work close to the counter without inconvenience. Vaults for the storing of records upon the main floor and in the basement have been made commodious and well lighted.

The collection wickets are unique in the absence of any grilles. Instead a protected wall of the Houteville marble has been built on each side of the wicket to protect the change-making machines and records of the company, kept behind them. The cashier clerks are also placed in direct touch with the bookkeepers and other officials of the company by means of intercommunicating phones. The collection wickets are located in the rear of the lobby, making for greater protection of the funds handled.

A rear passageway connects the commercial offices with the special rooms of the new business and paymaster's departments, located on the E Street side of the building, also on the main floor. Here the new business department has a range and water heater exhibit and it is from here that the salesmen operate.

A large room in the basement is being prepared for an electric range and appliance demonstration room as well as for gas appliances and general exhibits of company material. A gas sales testing laboratory is in the rear of this demonstration room. The billing department which has to be kept in close contact with the collections and order departments, is located on the north side of the second floor of the building in a spacious, well lighted room. Communication between the billing offices and the ground floor offices is maintained through both the pneumatic systems and the new intercommunicating phones.

Please Use 3 Lights Instead of 4

Why the farmers especially ask you for this great co-operation. Your action will *help save their crops.* It will help to keep general business better, on which *your own* prosperity largely depends.

8 Ways
You Can Save Electricity
In Your Home
1. Unscrew all bulbs from lighting fixtures not absolutely needed.
2. Unscrew unnecessary bulbs in chandeliers and group lights.
3. Use smaller bulbs wherever possible.
4. Turn off lights when not needed (listen to your radio in the dark.)
5. Arrange so two or more persons can read from same lamp.
6. Use porch, hall, garage and basement lights only when immediately required.
7. Put away your electric utensils—toasters, percolators, waffle irons, etc.,—use the kitchen stove. Discontinue temporarily the use of electric fans.
8. Enlist the aid of servants and all members of your family to save electricity.
Practice These Savings
In Your Business
1. Discontinue all local sign and display lighting.
2. Discontinue all flood lighting.
3. Use only half the usual lighting in show windows. Basis one watt per square foot.
4. Reduce interior lighting by removing at least one-fourth the lamps.

ONE light less in four deprives you of very little light. Please give the electricity that light saves to the Southern California farmer. He needs it very badly and you can spare it.

Southern California's crops, valued at 180 million dollars, depend on adequate irrigation.

The need is this:

There is a great power shortage.

Due to the light rains and consequent deficiency of hydro-electric power, Southern California is lacking in enough electricity to take care of its normal requirements for light and power.

Electricity is a farm necessity. Electrically operated pumping stations furnish most of the water used for irrigation.

Due to light winter rains there is no moisture stored in the soil this year and more than the usual amount of water is therefore needed. Water drawn direct from our mountain watersheds is also scarce, necessitating more pumping. As a result, the below-the-surface level of water has dropped so that our wells must go deeper and therefore require more electricity for pumping.

And now, on top of this need for extra irrigation, comes a 25 per cent curtailment of electricity on the farm.

Thus Southern California's valuable agricultural crops may suffer through lack of water. And any blow dealt our basic industry—agriculture—means a direct loss to every firm and person in Southern California.

But enough electric power to maintain our farm production can be furnished if all waste and non-essential use of electricity be immediately eliminated.

You can help in this emergency if you will save and stint in the use of electricity. Los Angeles can protect its own prosperity by saving electricity for the farmer.

These two organizations, representing thousands of farm homes and farm workers, appeal to the public-spirited citizens of Los Angeles to meet this emergency.

California Fruit Growers Exchange
California Walnut Growers Association

Save Electricity and Save the Crops

To encourage southern California domestic and commercial consumers of electricity to assist in conserving electric energy, advertisements of this character have been placed in the leading papers in that vicinity by the California Fruit Growers' Exchange and the California Walnut Growers' Association. Cooperation of this sort is also being requested by other farmers' organizations in order that greater quantities of power may be made available for use in the agricultural districts for irrigation.

Unusual Cooperation by San Diego Electrical Body

In Collaboration with I.B.E.W., the U.S. Marine Corps and the Mayor a Charitable Home Is Wired Gratis in One Day

A mayor, a major-general of the U.S. Marine Corps, the electricians' union and the whole electrical industry of San Diego, Calif., were recruited to a notable act of charity on May 10, by the San Diego Electrical Exchange, formerly the Contractors' and Dealers' Association, when the complete wiring installation of the Helping Hand Home in San Diego was done in one day by these combined forces, labor and materials for the entire job being donated to the cause.

The Helping Hand Home is a private hospital supported by private donations, dedicated to the care of the children of tubercular parents, especially those who may be touched by the disease themselves. Funds for the erection of a new building were raised recently but these funds were felt by the Electrical Exchange of San Diego to be needed badly for other things besides wiring. Wanting to see that nothing but the best of electrical equipment went into the new structure, the Exchange arranged to have the entire work done without one cent of cost to the Home.

The International Brotherhood of Electrical Workers, local No. 569, responded unanimously to the invitation of the Exchange. Saturday is a holiday with them and so the work was planned for May 10. Materials were furnished by the contractors and dealers. The street railway company furnished transportation to those who were to work on the job, and the power company was ready with a crew to set the meter and turn on the power the minute the city electrical inspector said the word.

Operations began at 8 o'clock in the morning, with about seventy electricians on the job. This force was soon augmented by the city electrical inspection force, the contractors, the city officers, the mayor, power company employees, Major-General Joseph H. Pendleton of the Marine Corps, and others. Carl Heilbron, who was appointed foreman for the job, laid out the work by sections and stripped every man of his collar and tie before work started.

Mayor John Bacon was made a tool carrier and general helper, Major-General Pendleton was assigned pipe bending because he claimed to have had some experience in the line, and everyone entered into the occasion with a holiday spirit that rushed the job through far ahead of schedule. At noon all hands knocked off for lunch, which was provided and served by the women of the Home and the wives of the electrical men. The job was so soon completed that the first group was laid off at 1:30 in the afternoon and the last at 2:45 p.m., when the power was turned on.

When the plastering is done and the Home made ready for the installation of fixtures, these, too, will be put in by the contractors and electricians of San Diego, who received so much joy out of the work they did for common good that they are anxious to repeat the experience. It is estimated that the electrical work completed in that one day would have taken a month to complete under ordinary circumstances and would cost about $3,000.

Some of the members of the San Diego Electrical Exchange who donated material and services for wiring the Helping Hand Home for children of tubercular parents. The work which would ordinarily have cost the home $3,000, was done in less than one day and the contribution represented the gift of the combined electrical interests in San Diego.

San Francisco Power Bond Issue Temporarily Abandoned

A decision to abandon, for the present, the proposal to call a bond election to secure additional funds for a municipal distributing system was made at the July 23 meeting of the public utilities committee of the San Francisco Board of Supervisors. At the same meeting the committee recommended that a special election be called within the next few months to vote bonds for further financing of the city's Hetch Hetchy water project. For some time it was doubtful as to whether or not the two proposals would be combined in one bond issue.

Warren Shannon, chairman of the committee, recommended that the bond issue for the distribution system be withheld until after the California Railroad Commission has made its valuation of the San Francisco distributing systems of the Pacific Gas and Electric Company and the Great Western Power Company. This recommendation was accepted by the committee.

Columbia River Power License Action Delayed.—The Federal Power Commission has delayed action on the application of the Washington Irrigation & Development Company for a license for a power project on the Columbia River at Priest Rapids. The commission has informed the applicant that no action will be taken until next fall. The company contemplates the erection of a 90-ft. dam at the site for irrigation and power development.

Colorado Utility Plans to Double Steam Generating Equipment.—Due to the oil boom in northwestern Colorado and the resultant industrial and commercial development of the region, the Craig (Colo.) Light & Power Company is planning on doubling its steam generating equipment. Engineers are now engaged on the plans and will later outline an addition to the distributing system.

Forest Resources of West Are Threatened by Fires

Forest resources of California are threatened, this year, by the most serious fire menace in the history of the state, according to the San Francisco office of the United States Forest Service. The principal cause of the danger is the unusual dryness of grass and brush due to drought and warm weather of the present season. Up to July 21, the Forest Service reported that approximately 900 fires had been discovered in the state. Two hundred of these fires were on state and private lands outside and 700 on government and private lands inside the national forests. On July 20 the burned area had reached the total of 150,000 acres and the estimated damage was around a million dollars. The two most hazardous months of the present season are yet to come.

In an effort to control the situation forest service officials have had up to 1,800 men fighting the fires, but on July 21 the forces had been reduced to about 450 men. The national forests have been closed to campers and the district forester has asked for and has secured federal troops to patrol the territory where the danger is greatest.

The fire menace is also serious in Oregon, Washington and Idaho. To date the fires have not been so extensive as those in California. In some parts of the Northwest July rains have relieved the situation somewhat.

Report on Northeastern Superpower Published.—A report designed to show the engineering and legal aspects of power development in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland and the District of Columbia, has recently been published by the Northeast Super Power Committee. Herbert Hoover was chairman of the committee. The report contains a comprehensive resumé of the growth of demand for power and recommends the extension of interconnection between the companies. A large number of charts and maps illustrate the committee's report.

Excess Power to Be Diverted to Southern California.—The California Railroad Commission has approved an arrangement whereby the Pacific Gas and Electric Company and the Great Western Power Company will divert their excess electric power to southern California to assist in relieving the shortage there. The power will be delivered by the two companies over the systems of the Coast Valleys Gas & Electric Company and the San Joaquin Light & Power Corporation. The Southern California Edison Company will receive the energy for distribution. The arrangement was made under the direction of H. G. Butler, state power supervisor.

Bear River Company Applies for Permit.—An application for a permit to appropriate 250 sec.-ft. and 100.000 acre-ft. of water from the Bear River in Placer and Nevada Counties, Calif., has been made to the California Department of Public Works by the Bear River Water & Power Company of Auburn. The company proposes to develop 42,994 hp.

Semi-Annual Report of California Cooperative Campaign Published.—Presenting the high points of the California Electrical Cooperative Campaign's work during the first six months of 1924, a mimeographed report of the organization's activity has been published. The report tabulates and records the work done in connection with its adequate wiring program, the electric home program, better lighting program and the miscellaneous activities. Announcement is also made that plans have been completed for the displaying of three more electric homes in the state. These exhibits will be offered at San Rafael Aug. 15-25; at Santa Cruz, Aug. 22-31; and at Napa, Sept. 1-15.

Municipal Plant to Be Built at Fallon, Nev.—Owing to the extreme water shortage, the town trustees of Fallon, Nev., have advertised for the construction of a $50,000 Diesel electric generating station to be erected and in operation by Aug. 15, 1924. Officials of the Nevada Valleys Power Company have reported to the city that the Lahontan hydroelectric plant will be closed down by that date as the water supply in the Lahontan reservoir will be exhausted.

Hetch Hetchy Power Line to San Francisco to Be Completed Jan. 1, 1925.—City Engineer M. M. O'Shaughnessy has made public a report which states that the transmission line from the Moccasin Creek power house to San Francisco will be completed not later than Jan. 1, 1925. The line is 98½ mi. long and is carried on 507 steel towers furnished by the Pacific Coast Steel Company at a cost of $438,000. Two types of conductors are being used, copper with a hemp core and aluminum-steel cable. The Anaconda Copper Mining Company is furnishing 177 miles of the former at a cost of $195,000 while the aluminum cable is being supplied by the Aluminum Company of America at a cost of $389,000. Insulators costing $141,000 are being furnished by the Westinghouse Electric & Manufacturing Company.

Will Not Urge Granting of Green River Application.—There is no disposition on the part of the Utah Power & Light Company to press its Green River application at this time, it is understood. The company recognizes that any effort at this time to alter the determination of the Federal Power Commission to hold up all applications involving the Colorado Basin could but have the effect of precipitating an acrimonious controversy. There is a feeling that development of the Colorado cannot be held up indefinitely but insofar as the Utah company is concerned the present is not regarded as a propitious time to agitate the matter.

Electric Safety Lamp Being Tested in Wyoming Coal Mines.—Preliminary tests are being made in the mines of the Union Pacific Coal Company in the Rock Springs, Wyo., coal mining district, of new electric mine safety lamps, looking toward complete installation. The new type lamps are to supplant the old and dangerous carbide lamps. They are fastened to the miners' caps and are connected with an insulated wire that leads to a battery carried on the miner's belt.

Application Made for Dam Site on Mokelumne River

Despite the lack of reservoir sites on the Mokelumne River, in California, Stephen E. Kieffer, of San Francisco, believes that at one point on the river a large reservoir can be operated successfully, thereby saving a portion of the run-off of that stream. His plans which have been filed with the Federal Power Commission, with his application for a preliminary permit, call for a high dam in the Mokelumne River, which will divert the water into a large basin on Dry Creek.

The Mokelumne River was considered by the city of San Francisco in connection with its water supply problem, but in conformity with a report made by C. E. Grunsky, it was rejected in favor of the Hetch Hetchy project. At the present time the cities of Alameda County are considering the Mokelumne River in connection with the study of their water supply resources.

General Electric Company Employees Enjoy Outing.—Following the usual custom, the employees of the Los Angeles, Calif., office of the General Electric Company, with their families, held their annual picnic at Hermosa Beach on June 28. About two hundred and

Books and Bulletins

MECHANICAL ENGINEERS' HANDBOOK

By LIONEL S. MARKS, Editor-in-Chief, Professor of Mechanical Engineerisg, Harvard University. 1,986 pages, 1,000 illustrations. Flexible binding, 4½ x 7 in., thumb indexed, $6.00. Travelers' Edition in pocket-size waterproof flexible Keratol covers, with separate index, $8.00. Published by McGraw-Hill Book Company, Inc., New York, N. Y.

The second edition of this handbook contains valuable revisions that place it on a strictly 1924 basis.

To quote from the preface:

"The second edition is an attempt to state the best engineering theory and practice as it stands at the beginning of 1924 in those branches which are of the most interest to the mechanical engineer.

"Revisions have generally been made by the original contributors, but in cases where the original contributor was not available the work has been done by other specialists."

Important sections on drying and lubrication have been added and despite condensation of material about one hundred and fifty pages have been added. Manufacturers' tables have been reduced to those fully standardized and largely segregated.

The subjects of hydraulics, heat, iron and steel, non-ferrous metals and alloys, bearings, steam boilers, internal combustion engines, aeronautics and air compressors have undergone the most changes. Each section is complete in itself and represents the best work of the best available authority on that subject.

That the book has carved its niche at the engineer's side is evidenced by the fact that the first edition has amounted to 65,000 copies.

Meetings

Denver League to Hold Fourth Annual Picnic Aug. 7

The fourth annual picnic and outing of the Electrical Cooperative League of Denver, Colo., will be held Aug. 7. Preliminary plans have been announced by J. C. Davidson, chairman of the entertainment committee.

A half holiday is planned by the electrical industry in Denver and suburban territory so as to permit of a program that will start with a ball game at two o'clock in the afternoon and will end with a theater party at night. The picnic will be held at one of the nearby amusement resorts as has been the practice in former years.

There will be races and all forms of stunts, according to V. N. Garretson who is heading that particular activity. A special number will be featured for members of the League's advisory board. Prizes, donated by the industry, will be given to all winners and a special appliance drawing will be held at dinner time to determine the award of fifty prizes ranging from a washing machine to a flashlight. E. C. Headrick, former chairman of the league, is in charge of this activity.

Over 2,000 tickets have been distributed for sale and it is the opinion of A. E. Bacon, vice-chairman, that last year's attendance will be topped. H. D. Randall, the new chairman, will return to Denver from the East in time for the outing.

San Diego Electric Club Holds July Social Meeting

To celebrate the opening of the new line of the San Diego Electric Railway from San Diego to La Jolla, Calif., and to visit for the first time the new hotel at La Jolla, known as Casa de Manana, the San Diego Electric Club held its July social outing at the hotel on July 15. The club members were interested in both projects as many of them had been active in the construction of the street car line and others had done the wiring on the new hostelry.

Following the arrival at the hotel, dinner was served and later parties spent the evening in dancing and in visiting the interesting parts of the hotel. An electrically lighted moon, shining in the patio, brought forth considerable favorable comment from the visitors. Sixty-five members and guests attended the meeting.

Plans for Camp Cooperation IV Are Being Formulated

Acting on a resolution passed at Camp Cooperation III, held in September last year, The Society for Electrical Development has organized Camp Cooperation IV. This will be the third annual conference of representatives of national and local cooperative organizations and others interested in local business-building activities. The dates of the conference to be held at Association Island, Henderson Harbor, N. Y., are Sept. 2-6.

A committee under the chairmanship of J. E. North, president of the Electrical League of Cleveland, is responsible for the business program. Some of the subjects selected by Mr. North's committee for inclusion in the program are: Red Seal Campaign, Selling Electrical Merchandise Through Community Electrical Exhibits, How to Interest Women in Electrical Equipment for the Home, Field Service Work, Store Lighting Campaigns, Selling More and Better Industrial Electrical Equipment, How the Local Electrical Cooperative Organization Benefits the Various Branches of the Industry. At least one full business session will be devoted to the Home Lighting Contest, sponsored by the Lighting Educational Committee.

The necessity for some satisfactory method of tying in local cooperative organizations was discussed last year at Camp Cooperation III and a committee, under the chairmanship of Earl E. Whitehorne, was appointed to draw up a plan. This committee will be prepared to make a report.

COMING EVENTS

Conference of Representatives of Electrical Leagues—
Camp Cooperation IV, Association Island, Henderson Harbor, N. Y.
Sept. 2-6, 1924

Rocky Mountain Division, N.E.L.A.—
Annual Convention—Glenwood Springs, Colo.
Sept. 15-17, 1924

Colorado Public Service Association—
Annual Convention—Glenwood Springs, Colo.
Sept. 15-17, 1924

California State Association of Electrical Contractors and Dealers—
Annual Convention—Santa Cruz, Calif.
Sept. 19-21, 1924

Pacific Division, Electrical Supply Jobbers' Association—
Quarterly Meeting—Del Monte Lodge, Pebble Beach, Calif.
Sept. 25-27, 1924

Association of Electragists, International—
Annual Convention—West Baden Springs, Ind.
Sept. 29-Oct. 4, 1924

Illuminating Engineering Society—
Annual Convention—Briarcliff Lodge, Briarcliff Manor, N. Y.
Oct. 27-31, 1924

Jobbers to Meet at Del Monte Lodge in September. — The next quarterly meeting of the Pacific Division of the Electrical Supply Jobbers' Association will be held at Del Monte Lodge, Pebble Beach, Calif., Sept. 25-27. Reservations for the meeting are being received by Albert H. Elliot, secretary of the association. The capacity of the lodge is limited and members have been urged to make reservations immediately.

Ogden Engineers Hold Banquet.—The Ogden chapter of the American Association of Engineers tendered a banquet to the members of the Ogden press on the evening of July 9, in appreciation of the cooperation given by the newspapers in the publicity contest conducted nationally. The Ogden chapter has won the contest each year for the last three years, thereby obtaining permanent possession of a banner given as a prize. Charles W. Cross, president of the chapter, was master of ceremonies.

Sacramento Valley Electrical Society Meeting

The regular meeting of the Sacramento Valley Electrical Society was held at the Hotel Land, Sacramento, Calif., July 9, at 6:30 p.m. "Hal" Willis presided over the dinner and business meeting and gave a report of his trip to Coronado where he attended the meeting of the Pacific Coast Electrical Association.

The program of the evening was in charge of the electrical contractor-dealer members of the society. The principal speaker was "Bob" Prussia of the Westinghouse Lamp Company, San Francisco, who gave an interesting address on "The Commercial Advantages of Proper Illumination." Ellis Purlee related humorous stories, and musical selections were rendered by Curlee's Jazz Orchestra.

Annual Convention of Illuminating Engineering Society to Be Held Oct. 27-31.—The annual convention of the Illuminating Engineering Society will be held during the week of Oct. 27 to 31 at Briarcliff Lodge, Briarcliff Manor, N. Y. A papers program is being arranged by Frank C. Taylor, chairman of the committee on papers, embracing such subjects as: Daylight Illumination in Factories, Sky Brightness Report; Color Standards and Nomenclature; a session at Boyce Thompson Institute for Plant Research devoted to the effect of light on plant growth; store, window and showcase lighting; theatrical and decorative lighting; street lighting practice in the United States; school lighting; Light and the Speed of Vision; Psychology of Light and Color; Glare; Eye Defects in Industrial Work, and others.

California Industries Exposition to Be Held Oct. 18 to Nov. 1.—Reservations for exhibit space for the Fourth Annual California Industries Exposition, to be held in San Francisco Oct. 18 to Nov. 1, are being received. The Palace of Electricity, featured for the first time last year, will be reserved for electrical exhibits again this year. Special attention will be paid to this section by the exposition management. To assist the electrical exhibitors, a special committee of the San Francisco Electrical Development League, headed by C. L. Chamblin of the California Electrical Construction Company, has been appointed.

Electragists' Manager to Address Meetings.—Members of the electrical industry of Oakland, Calif., have been invited to attend a meeting to be held Aug. 6, at which Laurence W. Davis, general manager of the Association of Electragists, International, will be the principal speaker. The meeting will be held in the auditorium of the Pacific Gas and Electric Company Building in that city. Mr. Davis will also speak before the San Francisco Electrical Contractors' and Dealers' Association on Aug. 7, at the organization's regular weekly meeting held at the States Restaurant at 12:15 p.m.

A.E.S.C. Year Book Is Published.—The American Engineering Standards Committee has recently published a report of its activities during the past year.

Manufacturer, Dealer and Jobber Activities

The Westinghouse Electric & Manufacturing Company has recently published two supplements to its 1923-24 catalog of electrical supplies. The first, Supplement 4 to Section 8-B of the catalog, gives a description and price list of Paragon post tops for ornamental street lighting equipment. This post top can be equipped with the new Bi-lux refractor, making a very efficient and attractive unit for street lighting purposes.

Frank E. Herthum has purchased the business of the Peerless Fixture Works, 2410 South Main Street, Los Angeles, Calif. He will continue the firm name and will do a general wiring and repair business in addition to the manufacture of fixtures.

The Sawtelle Electric Company, which has been occupying temporary quarters during the construction of its new building at 11308 Santa Monica Boulevard, Sawtelle, Calif., has moved into the new building.

The Glendora Electric Company, formerly located at 181 North Michigan Avenue, Glendora, Calif., has moved into its new building at 121 North Michigan Avenue of the same city. Better facilities for appliance and fixture display are presented in the new location.

The Industrial Works, Bay City, Mich., has recently put on the market a new 10-ton crawling tractor crane. One of the features claimed for the new crane is the independent control of the traveling, slewing and hoisting motions. Information concerning the crane may be secured from the manufacturer.

Quigley Furnace Specialties Company, Inc., New York, N. Y., has issued a booklet devoted to a description of the use of Hytemptite in the power plant. The bulletin shows how the product may be used in new and repair jobs in furnaces.

The J. G. Blount Company, Everett, Mass., has recently placed on the market a new ball-bearing motor-driven buffing machine of large capacity for buffing heavy plates, brass tubing, etc. The new machine is claimed to be of exceptionally heavy construction and is driven by a 7½-hp. Westinghouse motor operating at 1,800 r.p.m. and controlled by a push button.

The Lionel Corporation, New York, N. Y., has recently been granted a registered trade mark on the words "Lionel Standard." The mark "Lionel Standard" has been used by the company to identify its line of toy trains for the 2¼-in. gage track and since the words have been registered it will continue to use the name.

The Johns-Pratt Company has issued a sheet of revised catalog numbers to supplement its Catalog 53. The sheet refers to Noark universal service switches.

The Economy Fuse & Manufacturing Company, Chicago, Ill., has recently appointed Morgan P. Ellis general sales manager of the company. Mr. Ellis has been assistant sales manager of the company for the past eight years.

H. F. Elliott has purchased the business of the Jennings Electric Store, 912 Broadway, San Diego, Calif. Mr. Elliott is specializing in the sale of electric appliances.

The Tork Company, Inc., New York City, has announced the election of Ralph D. Ward as vice-president of the company. Mr. Ward is also president of the Electruck Corporation.

The Western Pipe and Steel Company of California is issuing an interesting house organ under the title of "Western Pipe and Steel News." The first issue contains interesting illustrations of the application of steel water mains and corrugated culverts.

S. S. Kingston has opened a new radio store at 10 Fourth Street, San Francisco, Calif., where he will carry a complete stock of sets and parts.

Wagner Electric Corporation, St. Louis, Mo., has prepared for distribution three booklets relating to the Fynn-Weichsel motor. The booklets are entitled, "The Motor that Corrects Power Factor," "Some Recent Comprehensive Tests on the Fynn-Weichsel Motor" and "Tests on the Fynn-Weichsel Motor." The first two of these are by H. Weichsel, chief designing engineer of the Wagner company, the first being a reprint from Iron and Steel Engineer and the second a paper read before the joint convention of the Southwestern Division of the National Electric Light Association and the Southwestern Public Service Association. Royce E. Johnson is the author of the third paper which was presented before the Electric Section of the Wisconsin Utilities Association.

The General Electric Company has recently placed on the market a new type of induction time delay overload relay, to be known as the IA-201. The contact mechanism of this relay is claimed to be of an improved design, the contacts themselves being so arranged that they cannot be closed by vibration or jar. A target is provided to indicate that the relay has operated.

Russell Electric Company, Chicago, Ill., has recently placed on the market a new model curling iron. The device is 10¾ in. overall and the curler rod is 6 in. in length.

The Connecticut Electric Manufacturing Company, Bridgeport, Conn., has placed on the market new types of plates for toggle switches and for convenience outlets. The plates are all made of brown Bakelite and are designed for use in homes where it is desirable to eliminate the use of brass plates. The company is now supplying the plates on its toggle switches and on both single and duplex unit receptacles.

Maydwell & Hartzell, Inc., San Francisco, has moved its Los Angeles, Calif., office from the Metropolitan Building to the Transportation Building in that city. The company has recently been appointed distributor for the Valley Manufacturing Company of Woodburn, Ore. The latter company manufactures insulator pins and brackets. The appointment of the company as Pacific Coast distributor for two other manufacturers has also been announced. The new contracts are with the Providence Insulated Wire Company of Providence, R. I., manufacturer of rubber insulated and weatherproof wires and cables; and the Harrah Manufacturing Company of Bloomfield, Ind., manufacturer of Handyman pole puller and other construction tools.

Groundulet Company, Newark N. J., has printed an article by Stephen W. Borden, entitled "Protective Grounding of A.C. Services." The article is replete with information on protective grounding. Various data in the paper are secured from the company's bulletin "Groundits and Groundology." Either article may be secured from the Groundulet Company.

The Great Western Electric Company, 615 East Ninth Street, Los Angeles, Calif., has recently enlarged its quarters in order to take care of increased business.

Merchandisers of electrical appliances have learned to analyze conditions and it may be for that reason that they make good fishermen. F. H. McGinnis of Sacramento, Calif., seems to be no exception to the rule as the string of fish he, together with Clinton O. Bailey and Elmer Christophel, brought in recently, indicates. We figured the average catch to be 14 ⅓ fish. What's your average?

Personals

H. H. Jones, for the past fourteen years president and general manager of the San Diego Consolidated Gas & Electric Company, San Diego, Calif., has been made vice-president in charge of operations of the Northern States Power Company, the largest of the Byllesby properties, with headquarters at Minneapolis, Minn. Mr. Jones was

H. H. JONES

born in Reading, Pa., and graduated from Lehigh University with the degree of civil engineer. During the Spanish-American War he served with the Fourth Pennsylvania Volunteer Infantry. His business experience covers service with the Chicago, Peoria & St. Louis Railway, the City of Reading, Pa., the Pennsylvania Railroad, the Chicago & Northwestern Railroad, and the Springfield, Ill., Consolidated Railway Company, for which he managed first the street railway, and, later, the gas and electric distribution as well. For a year prior to coming to San Diego, he was manager of the Sand Point division of the Northern Idaho & Mountain Power Company, now the Mountain States Power Company. During his residence in San Diego he has taken an active part in commercial and civic affairs of the city. At a farewell reception held in his honor by the employees of the gas and electric company and their families Mr. Jones was presented with a platinum watch, chain and pen knife.

Leslie W. Nims, formerly division superintendent under Carl H. Wolfrom in the Idaho Falls, Idaho, division of the Utah Power & Light Company, has been appointed manager of that territory.

Harry W. Alexander, formerly director of publicity for The Society for Electrical Development, has been elected vice-president of Beatty & Company, insurance adjusters and brokers of New York City.

E. E. Walk, engineer of the Los Angeles office, General Electric Company, has returned from a trip of several weeks, having visited the various factories of that company in the East.

Carl A. Wolfrom, formerly manager of the Utah Power & Light Company at Idaho Falls, Idaho, has been appointed to succeed Ray Timmerman as manager of the Provo, Utah, division, with headquarters at Provo. Mr. Timmerman has resigned to accept a position with the Adirondack Power & Light Corporation at Schenectady, N. Y. Mr. Wolfrom has had many years' experience with the company, having first become associated with the Telluride Power Company, a predecessor of the Utah Power & Light Company, in 1902, as operator and plant superintendent of the Provo and Olmsted plants.

H. L. Jackman, manager of the Western States Gas & Electric Company, Eureka, Calif., was a recent visitor in San Francisco.

Edgar Kobak, formerly business manager of Electrical World and Industrial Engineer, has been appointed assistant vice-president of the McGraw-Hill Company, New York City, acting as assistant to the vice-president in charge of electrical publications.

J. H. Rudd, formerly assistant business manager of Electrical World and Industrial Engineer, has been named acting business manager of both papers.

N. M. Hope has recently become affiliated with the California Electrical Construction Company of San Francisco and will act as superintendent of construction for the company. Mr. Hope, during the past year, has been the San Francisco representative of the A-G Manufacturing Company of Seattle, Wash. Previous to his association with the switchboard manufacturer, Mr. Hope was connected with the electrical department of the Turner Company in San Francisco.

E. O. Shreve, San Francisco, Calif., district manager of the General Electric Company, has returned from an extensive trip to Schenectady, N. Y., and other Eastern cities. Mr. Shreve went East via the Panama Canal on the steamer Finland to attend the annual meeting of the Electrical Supply Jobbers' Association at Association Island.

W. C. Caffray of the Electric Sales Company, Los Angeles, Calif., recently spent some time in San Francisco.

Herbert H. Frost, Chicago, Ill., manufacturer of radio equipment, was a recent visitor to San Francisco, Calif. Mr. Frost represents the Cunningham line in the East.

L. D. O'Connell, of the Westinghouse Electric & Manufacturing Company, was recently transferred from the El Paso, Texas, office to the merchandising division of the Los Angeles office.

Clare N. Stannard, vice-president and general manager, Public Service Company of Colorado, Denver, Colo.; **A. C. McMicken,** sales manager, Portland Electric Power Company, Portland, Ore.; and **A. Emory Wishon,** general manager, San Joaquin Light & Power Corporation, Fresno, Calif., have been appointed regional directors to carry out the work of the Better Home Lighting Activity campaign.

M. P. Cannon of Latourette-Fical Company and **R. J. Finchley** of the California Mechanical & Electrical Engineering Company were among the contractor-dealers from Sacramento, Calif., who attended the recent meeting of the California State Association of Electrical Contractors and Dealers held at Pit River.

R. H. Ballard, vice-president and general manager of the Southern California Edison Company, Los Angeles, Calif., was a recent visitor to San Francisco on business for his company.

Tracy W. Simpson, formerly Pacific Coast manager of the Federal Electric Company, Chicago, Ill., has been appointed manager of the Western office of the Household Utilities Finance Corporation, Chicago, Ill. The Pacific Coast offices of the concern will be in the Rialto Building, San Francisco, Calif.

G. C. Ward of the Southern California Edison Company, Los Angeles, Calif., recently visited San Francisco.

J. C. Jones, manager of the central station division of the Westinghouse Electric & Manufacturing Company, Los Angeles, Calif., recently went East to visit the Newark Works of that company.

T. E. Bibbins, president, and **D. E. Harris,** vice-president and sales manager, Pacific States Electric Company, San Francisco, Calif., recently returned from New York and Association Island.

S. W. Scott of the Westinghouse Electric & Manufacturing Company, Los Angeles, Calif., recently returned from an Eastern trip, having visited the Pittsburgh, Pa., and Springview, Mass., Works of that company.

Hiram W. Clark, who was recently elected president of the Utah Section of the American Institute of Electrical Engineers, graduated from the University of Utah in 1917 with a B.S. degree in electrical engineering. For six months following that time he was associated with the Denver Gas & Electric Company as junior engineer, and until the summer of 1918 was also doing engineering work with various fuel companies in Colorado and Utah. He then took up work with the United States Bureau of Mines, and devoted considerable time to the study and application of the Cottrell precipitation process. In the fall of 1920 he entered into smoke

HIRAM W. CLARK

investigation work with the engineering department of Salt Lake City, Utah, and was later appointed chief deputy smoke inspector and special assistant to the city engineer. His activities since that time have been largely devoted to handling some of the problems of smoke abatement in Salt Lake City. Mr. Clark is known as an enthusiastic worker for the best interests of the American Institute of Electrical Engineers in his section.

C. E. Grunsky, consulting engineer of San Francisco, Calif., has been elected president of the Pacific Division of the American Association for the Advancement of Science.

Frank T. Broiles, of the International Electric & Machinery Company, Los Angeles, Calif., lately returned from an extended tour of various electric motor manufacturing plants in the East and Middle West.

Robert ("Bob") Prussia, of the San Francisco office of the Westinghouse Lamp Company, recently delivered an address before the Sacramento Valley Electrical Society, Sacramento, Calif., on "The Commercial Advantages of Proper Illumination."

W. A. J. Guscott, president of the Denver, Colo., Electrical Contractors' Association, has been elected vice-chairman of the Electrical Cooperative League in that city.

T. C. Bond, electrical contractor of Chicago, Ill., paid a visit to San Francisco, Calif., recently.

Gilbert C. Tompkins, president of Research Engineering Corporation, New York City, has gone to Europe to attend the World Power Convention.

A. J. Clark, for the last thirteen years agent at Vancouver, B. C., for the Canadian Pacific Telegraph Company, has been promoted to superintendent of traffic and tariff at Winnipeg, Man.

Arnold Pfau, president of the Wireless Resistor Company of America, Milwaukee, Wis., was a recent visitor to San Francisco, Calif.

Clyde L. Titus, Wyoming state manager of the Mountain States Telephone & Telegraph Company and well known in public utilities activities, has been elected president of the Wyoming Utility Association, after serving for a year as vice-president. Mr. Titus is one of the old-timers in the telephone business, having first entered the employ of the telephone company in 1882 at Denver as relief operator and general handy

CLYDE L. TITUS

man after school hours. In 1893 he returned to the telephone business and in 1906 was made Denver district manager. He served in this capacity until 1917 when he went to Wyoming as manager of the Cheyenne district. Later, this district was extended to include the entire State of Wyoming with headquarters in Cheyenne. He is active in club affairs, being one of the charter members of the Kiwanis Club at Cheyenne.

J. C. Hobrecht of the J. C. Hobrecht Company, Sacramento, Calif., has recently become a member of the Association of Electragists, International.

H. F. Hartzell, of Maydwell & Hartzell, Inc., has just returned from an extensive trip to the Northwest. Among other points he visited Sandpoint, Idado; East Milwaukie, and Portland, Ore., where he inspected various pole treating plants.

H. E. Sherman, Jr., vice-president and sales manager, Illinois Electric Company, Los Angeles, Calif., and **J. H. Jamison,** merchandise manager, Los Angeles branch of the Westinghouse Electric & Manufacturing Company, have just returned from a six weeks' trip to Chicago, Ill.; Mansfield, Ohio; Pittsburgh, Pa.; New York City and other Eastern points. While in the East, they also attended the National Electrical Supply Jobbers' Convention at Hot Springs, Va.

F. H. Woodward, general sales manager of the Great Western Power Company, San Francisco, Calif., has just returned from an extensive trip to Eastern cities. During his absence he attended the annual convention of Lions' Clubs at Omaha, Neb.

George J. Williams, Jr., for twenty-three years with the Pacific Gas and Electric Company, San Francisco, Calif., and for the past several years assistant purchasing agent of that company, has resigned to become a member of the firm of Richards Hardwood Lumber Company, San Francisco.

R. T. Stephens, superintendent of the new business department of the Pacific Gas and Electric Company, Sacramento, Calif., recently returned from a trip through the East and Middle Western states.

Harry L. Harper, Los Angeles, Calif., district manager, Western Electric Company, has just recently returned from an extended trip East, where he visited the main factory at Chicago, Ill., and various other branch factories.

John C. Jones, manager supply department, Westinghouse Electric & Manufacturing Company, Los Angeles, Calif., has just left for an extended trip to the factories at East Pittsburgh, Pa., and Mansfield, Ohio.

Charles G. DuBois, president of the Western Electric Company, New York City, recently sailed for Europe on business for his company.

R. D. Bean has been appointed chief engineer of the Brown Instrument Company, Philadelphia, Pa.

C. B. Crutchfield, of Hopkinsville, Ky., has been appointed southern field sales manager for the Leach Company of Oshkosh, Wis., manufacturers of concrete mixers, builders of saw rigs, and logging and line construction tools.

Herman Stadler, chief of the land classification branch of the U. S. Geological Survey, was in Salt Lake City, Utah, recently, preparatory to a trip which is now under way, with **R. A. Woolley,** hydraulic engineer attached to the Salt Lake City office of the survey, into the Green River basin looking over the possibilities for water power and storage development. Following the survey of the Green River basin the two plan to visit the Bear River basin and other regions of the state for the purpose of determining possible water power development.

J. C. Plankinton, best known through his ten years of electrical work in the Hawaiian Islands, on July 1 became sales manager of the Northwestern Electric Company at Portland, Ore., replacing Jay S. Groo. Mr. Plankinton is now in charge of all the commercial activities of the company. After graduating at the Oregon Agricultural College in 1910, with the degree of A.B. in electrical engineering, he went directly to the General Electric Company testing department where the better part of two years was spent. The latter part of this period was used in an intensive sales training course. The year 1913 found him in the San Fran-

J. C. PLANKINTON

cisco office of the General Electric Company where he spent less than a year and was then transferred to Honolulu as sales engineer with Catton, Neill & Company, representatives of the General Electric Company in the Philippine and Hawaiian Islands. Mr. Plankinton held this position for seven years and then became manager of the Hilo Electric Light Company at Hilo, T. H. Since 1923 Mr. Plankinton has again been on the Pacific Coast, part of the time with the Pacific States Electric Company at San Francisco.

A. G. Hoffman, representing the Midwest Radio Company of Pittsburgh, Pa., was a recent San Francisco visitor.

Percy H. Booth, vice-president and district sales manager, Los Angeles, Calif.; **Philip Randolph,** chief engineer, and **Grant Call,** manager of heavy duty equipment department, Chicago, Ill.; **Ray W. Turnbull,** assistant Pacific Coast sales manager, and **Ralph J. Cordiner,** special representative, Portland, Ore.; and **Bert Rowley,** manager, Salt Lake City, Utah, comprised a party of officials of the Edison Electric Appliance Company that recently visited Spokane, Wash.

J. P. Pullium, president of the Eastern Oregon Light & Power Company, and **A. G. Carson,** the president's assistant, have been visitors in Baker, Ore., coming from Milwaukee, Wis., to visit the Cove plant, the North Powder station and other power company properties.

T. W. Carlson, of the Benjamin Electric & Manufacturing Company, Chicago, Ill., has become affiliated with the Denver, Colo., office of that company and will cover the Rocky Mountain territory.

Trade Outlook

San Francisco

Business in wholesale and retail trade, manufacturing and industry is fair. Credit conditions are good; collections have slowed slightly. Interest rates are at low levels. New manufacturing enterprises are reported increasing in the bay section, and the market for articles manufactured locally is gradually becoming wider.

The iron and steel trade reports business quiet, but there is an optimistic feeling that there will be improvement from now on. Real estate transactions are reported as slightly below those of the same period last year. Department store sales have declined somewhat and stocks on hand are larger than at this time last year, which would indicate slower turnover of goods.

In the electrical line prices are fairly steady with an upward tendency, except in certain radio equipment such as amplifiers, some of which have been quite sharply reduced. Several export orders for assorted electrical goods have been placed by Mexican and Central American plants, but business from the Far East is rather uncertain.

On the whole, the feeling seems to prevail that prospects are good for active fall trade and that now is the time to make plans to take advantage of it.

Los Angeles

General business conditions show an improvement for the first two weeks of July, and increases have been noted in electrical manufacturing, jobbing and retailing lines. This condition prevails despite the slump in the building industry, which is approximately 30 per cent below the corresponding period of a year ago. There is a slight increase in bank clearings as compared with those for the same period last year.

The power shortage has adversely affected the sale of electrical heating appliances and major household devices. The "silver lining" to the power shortage is shown, however, in the increased sales and orders for farm lighting units and electrical generating equipment which have taken a sudden upward spurt, the demand for the latter being due to the fact that a larger number of industrial concerns are installing auxiliary power plants. Sale of radio sets and supplies is holding up well even under unfavorable weather conditions. Electric fan sales have not come up to expectations.

There is an abundant supply of labor with an over-supply in some lines. However, wages are remaining firm as are the prices of all commodities.

Portland

No marked change has been noticeable in general business conditions during the past two weeks. The volume of retail sales in general compares favorably with that of a year ago. Lumber production and shipments during the first half of this year ran a close second to the high records of 1923. Present production is light. A large volume of building construction is going on in all parts of the city, including a number of big jobs in the downtown retail district. The price outlook is favorable.

A survey recently made by the Oregon Public Utilities Information Bureau shows that the six principal light and power companies produced during the first six months of the year 14.2 per cent more energy than for the same period in any previous year. Betterment expenditures for all of these companies this year will be above normal and will total between fifteen and twenty million dollars.

The weather continues dry, requiring that the steadily increasing portion of the central station loads be carried on steam. In Portland the power companies are able to carry less than 50 per cent of their energy on hydro, a condition that has never existed before.

Seattle

Business conditions continue quiet. The shutdown over the Fourth of July, customary in the lumber industry, is being extended by some of the mills. There is little activity in commercial logging.

Building keeps up at a good pace, and plans for new construction, aggregating about $1,265,000, are now being considered.

The grocery business reports that, while business for the first half of the year has not been quite equal to that for a corresponding period in 1923, there is a feeling of optimism and improvement is looked for in the fall. Prices remain about the same, with a somewhat diminished demand due, in a measure, to the reduction in operations in the lumber industry. Conservative buying, both wholesale and retail, is reported. Bank clearings, as compared with this period last year, have declined.

Spokane

General conditions show little change, though there is a somewhat greater feeling of optimism in business circles than there was in June. The wheat crop has been estimated at 50 per cent of normal. Harvesting is now in progress and in many cases the actual yield is greater than that forecast.

In lumber circles, a curtailment of logging has resulted from a serious drop in prices, which have in some cases fallen below cost of production. This condition has helped the local woodworking plants which have taken advantage of the low prices to build up stocks of raw material.

The industrial power consumption in Spokane for June showed approximately 15 per cent decrease as compared with that of 1923. This reflects the condition of local manufacturing. The packing plants are working at excellent output and prices of livestock are being maintained at good figures.

Local activities in electrical merchandising are slack, due to general retail conditions which are poor. This is a seasonal effect, inevitable in the height of the vacation season. Mining production, particularly of silver-lead properties, is being conducted on a large scale. There is a distinct tendency of local investors to patronize new offerings of stock in legitimate lead-silver developments. The fruit crop for the whole Inland Empire is going to be very low, but good prices are expected. Altogether, this territory is in satisfactory shape and a good winter is anticipated.

Denver

Bank clearings, per capita savings, new building construction, employment and the general banking situation here are excellent. A slightly pessimistic note is evident, however, due possibly to the impending presidential election or the direct result of alleged business curtailment in the East. There is a surplus of unskilled labor, clerical help and migratory harvest workers.

Additional possibilities of oil in this state continue, and Denver is rapidly becoming a petroleum metropolis. New wells have been brought in both in the north central and norwestern fields, thus proving the discoveries of the existence of oil and gas made last fall. Commercial activity in the oil fields proper is booming.

Electrical jobbers report a slight falling off in sales. Many believe it a seasonal condition rather than actual depression. Central station operators are optimistic although there has been a small decrease in power demand. Hydro plants are not suffering from a shortage of water, and there is plenty of coal as most mines in the region are working on half time as is usual at this time of the year.

Salt Lake City

There appears to be no material change in the business outlook for the Intermountain section during the past month. Some concern is felt in the agricultural territory on account of unusually dry weather. Dry land grain cutting is under way in some places, but the crop is below normal due to the dry season. Irrigated grains, however, are doing well, and the fruit crop in general is expected to be fairly good, although it will be below that of last year. Last year, however, was exceptionally heavy, especially in apples.

Industrial activity continues satisfactory. This is particularly noticeable in flour milling, where new high records in output are reported.

Electrical appliances are in fairly good demand, and building activity is furnishing considerable work for electrical contractors. Retailers in various lines report that there is room for improvement in business, but this situation is somewhat due to the natural summer quietness.

Collections have not been so good during the past few weeks. This is largely due to the vacation season. The general business outlook is favorable. There appears to be no reason for pessimism, and, in fact, there is little evidence of it.